COMMERCIAL REFRIGERATION & AIR CONDITIONING

DECEMBER 1956

FRANCHISE CIRCULATION

WHAT EVERY CONTRACTOR SHOULD KNOW ABOUT

REFRIGERATION PIPING

page 40

STEVENS RICE
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MERCHANDISING, CONTRACTING AND MAINTENANCE OF COMMERCIAL, RESIDENTIAL AND INDUSTRIAL AIR CONDITIONING AND REFRIGERATION

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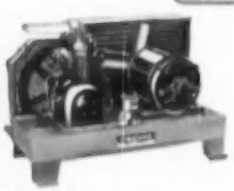

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Superior—engineered for every refrigeration need.

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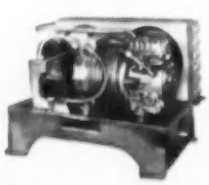

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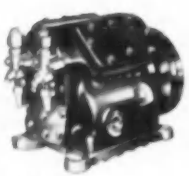
the accessible hermetic . . . The industry leader for rugged dependability.



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Designed for the critical needs of truck and auto air conditioning and refrigeration.

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5. Simple cage assembly contains only one packed stem. Replaceable for quick servicing. Interchangeable for wide capacity range.
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ENGINEERED THROUGHOUT FOR TROUBLE-FREE OPERATION!

9. Rugged come-apart constructions—corrosion-resistant materials.
10. Can be mounted in any position.
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1906

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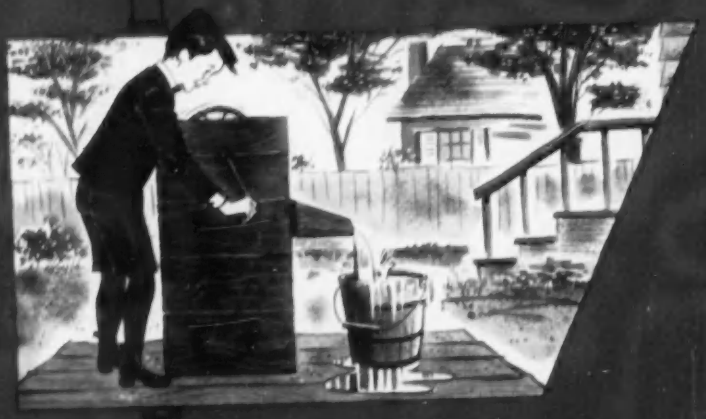

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Draw on Brunner experience for Refrigeration Condensing Units engineered to highest performance standards.

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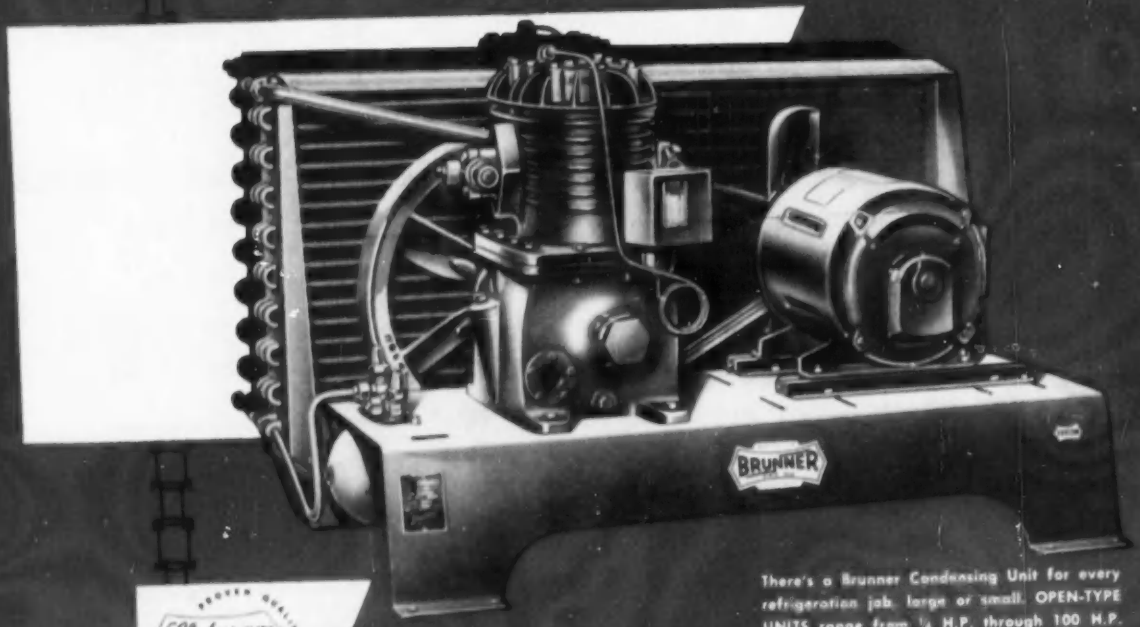

There's a Brunner Condensing Unit for every refrigeration job, large or small. OPEN-TYPE UNITS range from ¼ H.P. through 100 H.P. BRUNNER-METIC Semi-Hermetic Units from ¼ H.P. through 3 H.P.

PROVEN QUALITY
50th Anniversary
BRUNNER
DEPENDABLE

COMMERCIAL REFRIGERATION & AIR CONDITIONING

DECEMBER 1956 • VOLUME 13 • No. 12

READER'S GUIDE

FEATURE ARTICLES

40 **REFRIGERATION PIPING . . .** Here's a comprehensive discussion of what every cooling contractor should know about this extremely important phase of his business, including all the tables, charts, equations, and other figures necessary to properly size refrigeration piping for any normal-temperature systems.

48 **"DO IT YOURSELF" FLORIST BOXES . . .** prove profitable for this Colorado dealer who encourages florists to build their own fixtures and let him supply the refrigeration equipment.

49 **ICE RINK PROMOTES HOME COOLING . . .** for this enterprising air conditioning dealer in the desert city of Yuma, Ariz. Read how he powered his novel skating rink with a standard 5-hp residential air conditioning unit.

51 **3-WAY STRETCH . . .** Besides doing its regular job, the air cooled condenser serving this supermarket's freezer room performs a heating and ventilating function, too.

Air Conditioning Section

69 **MORE PROFITS IN '57 . . .** are well within the reach of those air conditioning dealers and contractors enterprising enough to capitalize on the many new developments of '56. Here is a summary of some of the new products and techniques that can help you install better jobs with bigger profit margins.

71 **SUPERVISORY DATA CENTERS . . .** Here's a close look at the "new look" in the control and instrumentation of large-scale air conditioning installations.

73 **FLEXIBLE DUCT — IT CAN SAVE TIME AND MONEY . . .** Case histories of two installations point up the advantages to contractor offered by this extremely adaptable material.

74 **IT COULDN'T BE DONE — BUT THEY DID IT! . . .** Here are three excellent examples of how the application of a little ingenuity helped these air conditioning contractors hurdle seemingly insurmountable obstacles.

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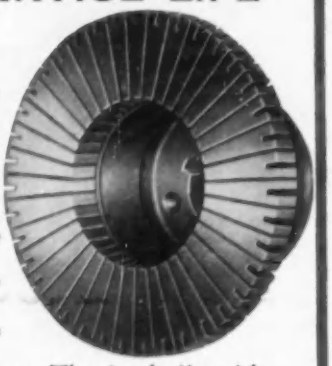
...here's a tip for **MOTOR REPAIR MEN** from GENUINE JOE

GENUINE
Wagner
COMMUTATORS ARE BUILT WITH EXTRA STRENGTH FOR LONGER SERVICE LIFE



Wagner Commutators . . . "proved best by high speed test"—that's a point to remember when you replace a worn commutator. Choose a *genuine* Wagner replacement. Wagner Commutators are designed to withstand great centrifugal force. They're built with care for longer service life. They're safe to reface, too.

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5. Entire assembly molded in high impact phenolic compound.

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Smart motor repairmen always carry a stock of Wagner Replacement Motors. They come in handy for emergency use when your customer needs immediate service and they're easy to sell as replacements for motors "too far gone" for repairs. You can get an attractive motor display rack for only $9.95 with the purchase of ten or more Wagner Motors. Check into this deal today.

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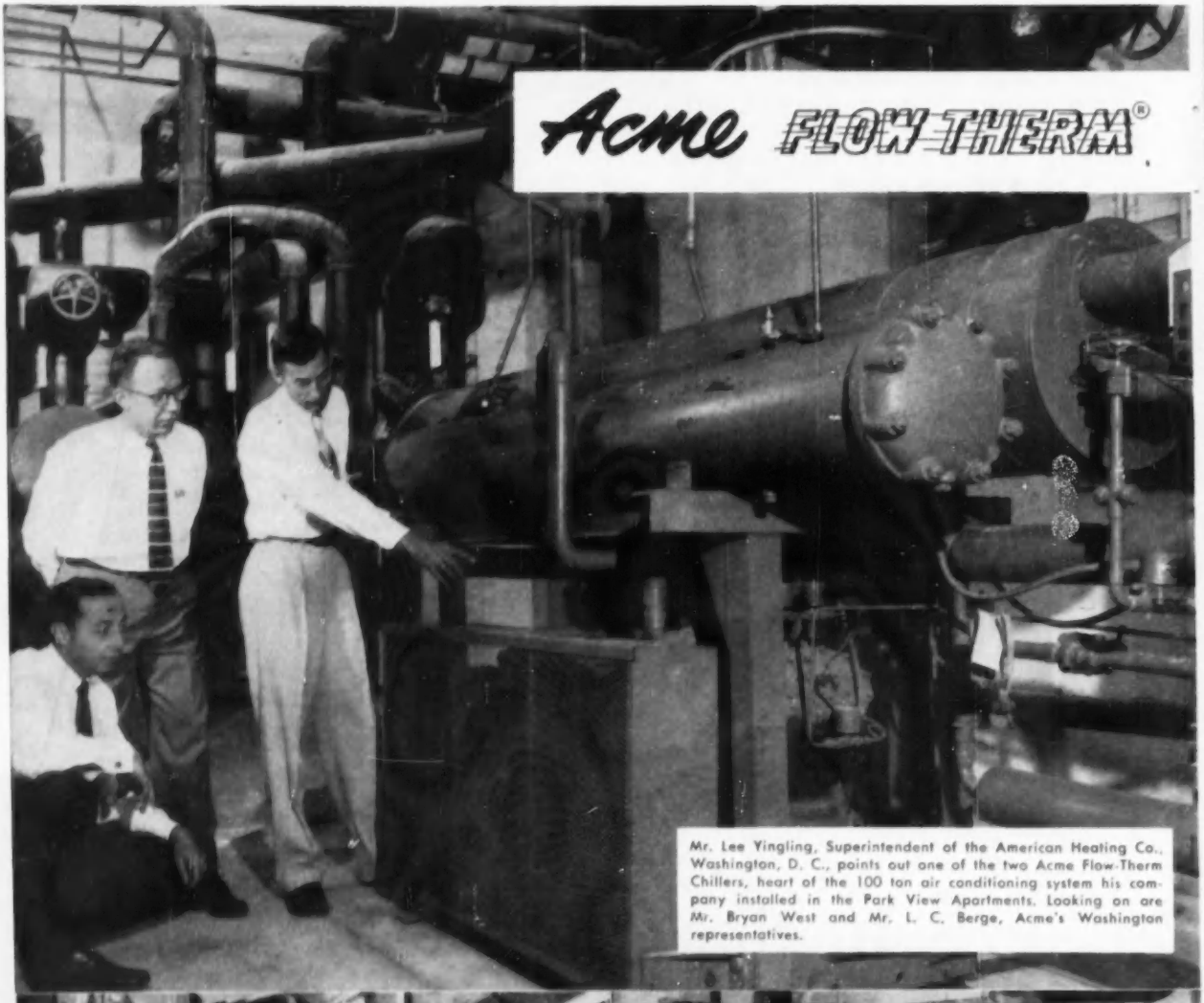
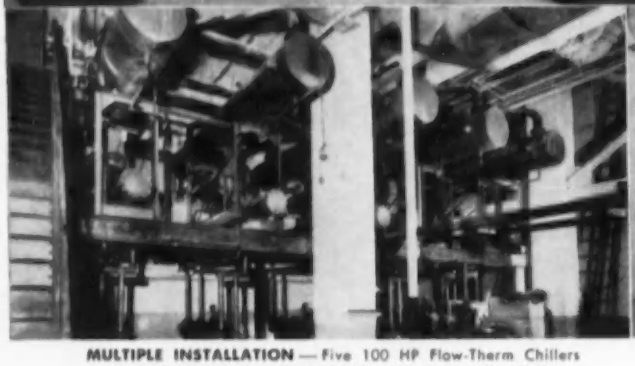
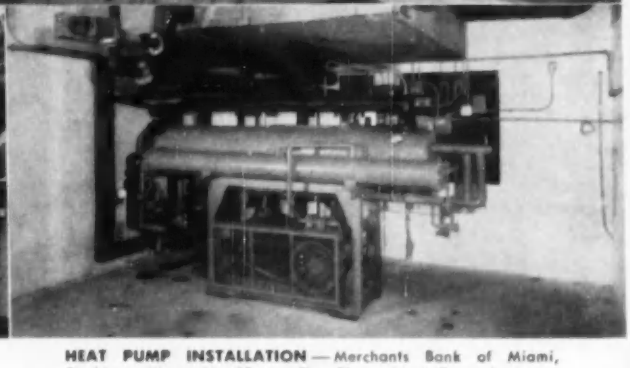


Mr. Lee Yingling, Superintendent of the American Heating Co., Washington, D. C., points out one of the two Acme Flow-Therm Chillers, heart of the 100 ton air conditioning system his company installed in the Park View Apartments. Looking on are Mr. Bryan West and Mr. L. C. Berge, Acme's Washington representatives.



MULTIPLE INSTALLATION — Five 100 HP Flow-Therm Chillers provide the Merchants Bank Building, Indianapolis, Indiana, with 500 tons of air conditioning. This system was engineered and installed under the supervision of Mr. John Beaulieu, Illingsworth Construction and Engineering Co., Indianapolis.



HEAT PUMP INSTALLATION — Merchants Bank of Miami, Florida, utilizes this 30 ton Flow-Therm Heat Pump for year-round heating and air conditioning. The system was engineered and installed by F. H. McDonald, Inc., in cooperation with Norman M. Giller and Associates, Architects.

ACME AIR CONDITIONING REFRIGERATION

Acme INDUSTRIES INC., Jackson, Michigan

Manufacturers of Quality Air Conditioning and Refrigeration Equipment since 1919

PACKAGED CHILLERS

PACKAGED HEAT PUMPS

EVAPORATIVE CONDENSERS and COOLING TOWERS

ROOM CONDITIONERS

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the truly *FLEXIBLE* Packaged Chiller

Park View Apartments look to Acme for air conditioning comfort that sells

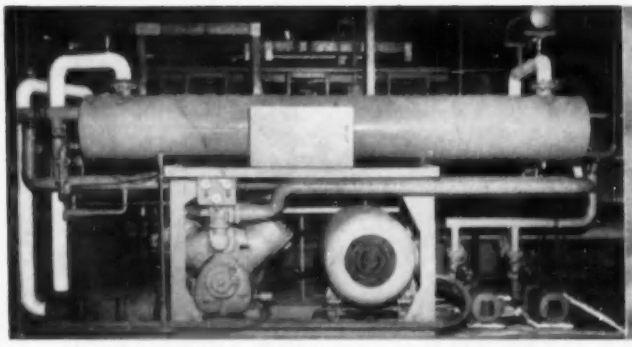
To insure the continuing popularity of their new Park View Apartments, Washington, D.C., Dan Pollin, Inc. insisted on having the most reliable air conditioning system possible. General Engineering Associates, consulting engineers for architects Berla and Abel, specified Acme . . . and with good reason. They wanted a system that would deliver full capacity for peak loads throughout Washington's long air conditioning season – they wanted a packaged chiller with proven dependability, one that was compact and economical to install. They knew an Acme Flow-Therm qualified in every respect.

With Acme you get a more complete range of models, with capacities to fit exact job requirements. This is possible because the Flow-Therm's chief components, famous Dry-Ex Chiller and Shell-and-Tube Condenser, can be tailor-made to match compressor performance exactly – combine operating economy with maximum capacity. The Flow-Therm is the most completely engineered packaged unit in its capacity range. All controls – electrical and mechanical — are supplied complete and ready for simple installation. When you buy an Acme Flow-Therm Packaged Chiller, it arrives on the job completely assembled, ready for connection to power and liquid lines.

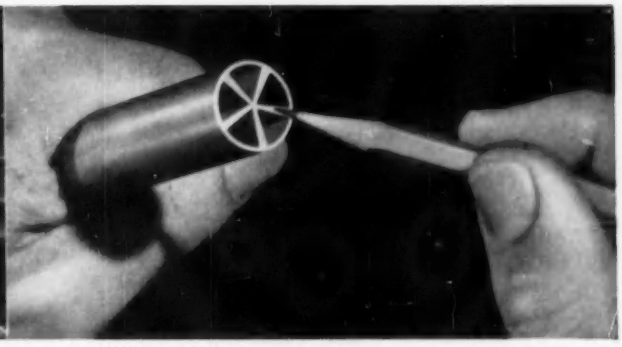
In addition to the normal factory tests for leaks and mechanical defects, all Acme packaged chillers are tested under full load conditions before leaving the factory. Every unit must perform satisfactorily at its nominal rating. Your guarantee of this tested operation is the new Acme Certificate of Performance, first in the industry. This assures the engineer and contractor, who specify and install Acme equipment, that Acme means *dependability*.

Acme Certificate of Performance issued on all Flow-Therm and Flow-Cold packaged liquid chillers, 3 through 150 tons.

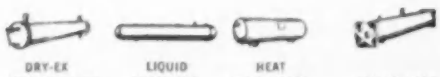
PROVEN FLEXIBILITY – Acme Flow-Therm Packaged Chillers have been proven in varied types of installations throughout the country. They have met all air conditioning, heat pump, and industrial processing requirements. Flow-Therm chillers are available in models complete with compressor, in a range from 20 through 150 tons – up to 300 tons for installations requiring remote compressors.



PROCESS COOLING INSTALLATION — This 100-ton Flow-Therm Packaged Chiller and a Dry-Ex fluid-to-fluid Heat Exchanger is cooling Zinc Cyanide Plating solution at Ford Motor Company's Sandusky, Ohio plant. Installation was handled by Udylite Corporation under the supervision of J. K. Rawsthorne, Sales Engineer for J. Geo. Fischer & Sons, Detroit, Mich.



EXCLUSIVE FEATURE — Key component of the Acme Flow-Therm — the Dry-Ex chiller — contains STAR-INSERT TUBING, an exclusive design that more than doubles the heat transfer surfaces . . . gives more chilling capacity.



DRY-EX LIQUID CHILLERS | LIQUID RECEIVERS | HEAT EXCHANGERS | CONDENSERS

Clip this coupon and attach to your letterhead, to receive your new Acme Flow-Therm Catalog.

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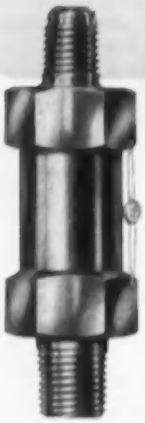
HENRY ASME relief valves

for Extra Capacity Extra Safety

UV ASME
NB National Board Certified

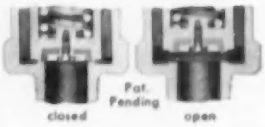
All Henry Relief Valves in the sizes and types listed below are constructed in accordance with the standards of the ASME. In addition these valves are stamped NB to indicate National Board Certification as to capacities.



Type 523 Straight-Through Relief Valves

FOR FREON AND SIMILAR REFRIGERANTS

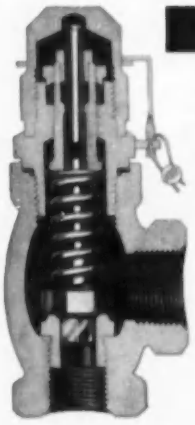
This relief valve has the Henry "Controlled Cushion" cup seat disc construction which prevents deformation of sealing ring and assures consistent operation. This design provides positive relief at predetermined set pressures. Brass construction. Sizes (inlet x outlet) ½" M.P.T. x ⅜" Flare; ½" F.P.T. x ½" F.P.T.; ¾" F.P.T. x ¾" F.P.T.; and 1" F.P.T. x 1" F.P.T.



"Controlled cushion" cup seat disc construction

Type 52 Angle Relief Valve

This forged brass valve is available in sizes (inlet x outlet) ½" M.P.T. x ⅜" Flare and ⅝" O.D.S. x ⅜" O.D.S.



FOR AMMONIA

Angle Relief Valve

Has soft metal alloy seat and push rod for emergency reseating. Stainless steel trim. Sizes (inlet x outlet) ½" F.P.T. x ¾" F.P.T.; ¾" F.P.T. x 1" F.P.T.; and 1" F.P.T. x 1¼" F.P.T.

All the above valves can be furnished at any desired pressure setting in the range of 50-350 P.S.I.

Write us for data sheet #AE-1303 showing new increased capacity ratings of these Henry relief valves.

See your Henry wholesaler for these certified relief valves.

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Cable: HEVALCO, MELROSE PARK, ILLINOIS

Specialized Manufacturers of the Complete Line of Relief Valves for Refrigeration and Air Conditioning

HENRY VALVE CO. CONTROLLING FLOW SINCE 1916

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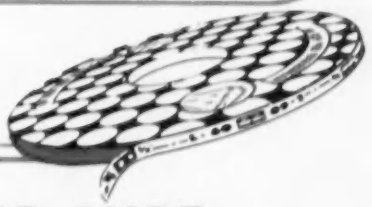
A FREE REEL *with* EVERY ROLL

That's right! Every time you buy Wolverine Roll-O-Tube® you get a convenient, work-saving reel—absolutely free! Here's all you do to put this exclusive built-in feature to work.

When laying a line of copper tube (radiant heat, street-to-house, etc.) just fasten or hold the tube at one end and roll the carton back. It's fast, easy—gives you a straight line free from awkward kinks.

Roll-O-Tube has still other advantages. It can be rolled—like a hoop—is easy to carry and easy to open. Unused tube remains in the carton protected against damage and dirt until needed again.

When you visit your wholesaler remember to ask for Wolverine Roll-O-Tube. Remember, too, that Wolverine also manufactures copper refrigeration tube, copper automotive tube, standard and extra heavy S.P.S. pipe in red brass and copper, and copper drainage tube.



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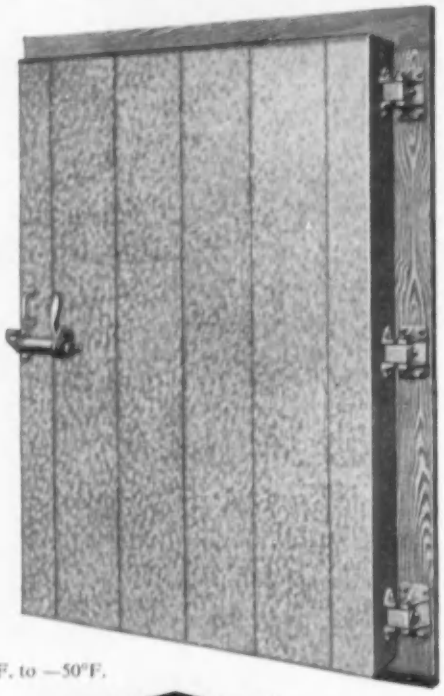
...on all SUPER FREEZER DOORS



For 0°F. to —50°F.

...on all LO-TEMP DOORS

For +15°F. to —20°F.

VAP·R·TYT* offers full protection against moisture penetration

*Vap-r-tyt is a Jamison trademark

Soldered Seams. All seams are locked and then soldered to prevent moisture under high vapor pressure from penetrating into the core of the door.

Vap-r-tyt . . . the application of metal with locked and soldered seams with all penetrating bolts sealed, is an exclusive Jamison feature. Vap-r-tyt adds longer life to cold storage doors by guarding against deterioration which invariably results when moisture condenses on the inside of the door. Jamison Super Freezer and Lo-Temp Cold Storage Doors are now being furnished with Vap-r-tyt as standard equipment.

For further information on Vap-r-tyt write to Jamison Cold Storage Door Co., Hagerstown, Md.

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HAGERSTOWN, MARYLAND, U. S. A.

More JAMISON Doors are used by *more* people than any other Cold Storage Door in the world.

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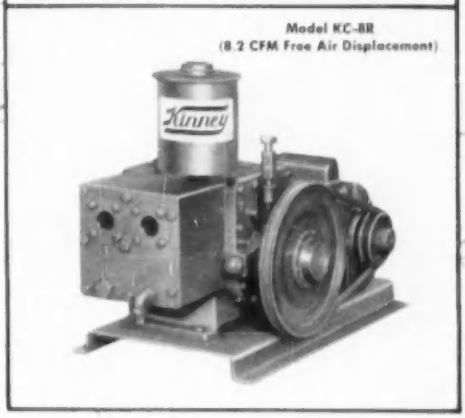
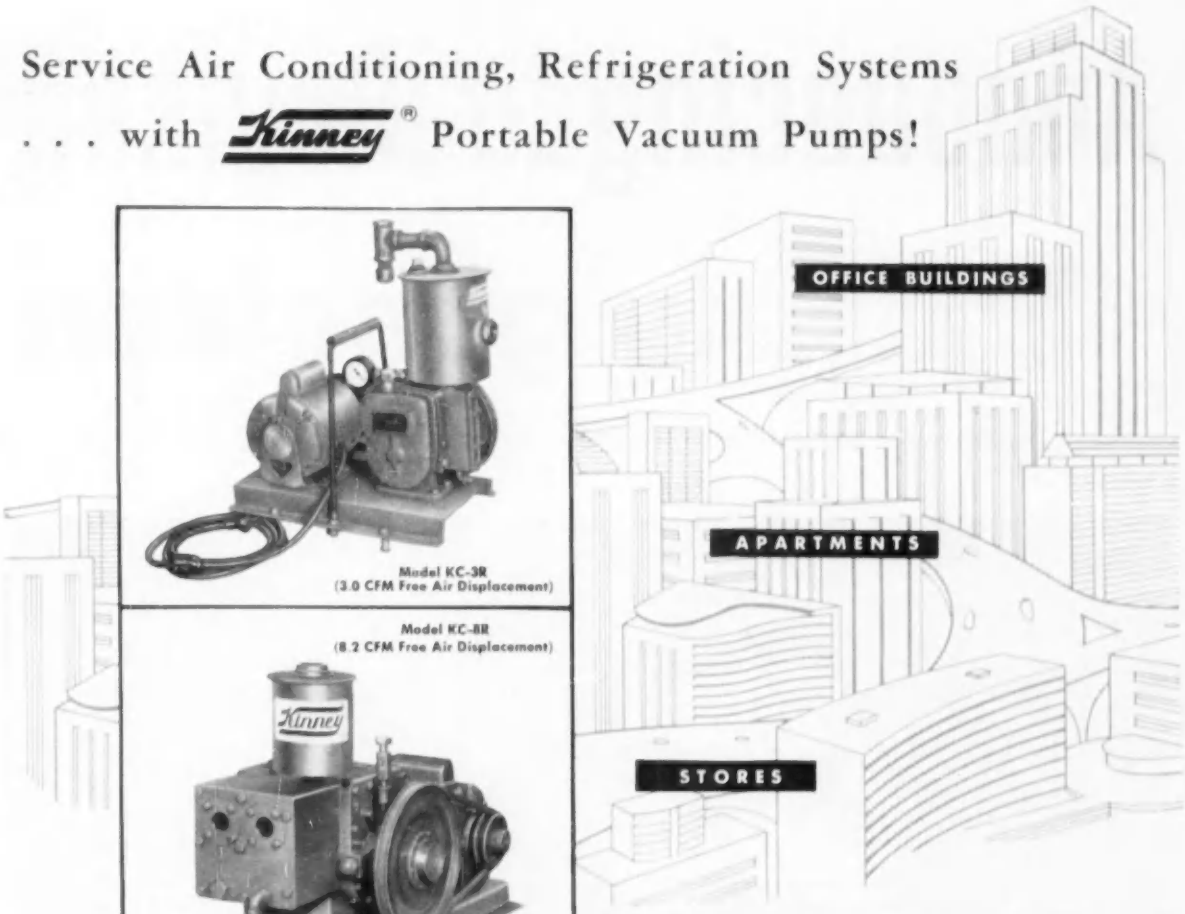
Service Air Conditioning, Refrigeration Systems . . . with Kinney® Portable Vacuum Pumps!

Model KC-3R
(3.0 CFM Free Air Displacement)



Model KC-8R
(8.2 CFM Free Air Displacement)



SPECIFICATION DATA	Model KC-3R	Model KC-8R
Free Air Displacement	3.0 CFM	8.2 CFM
Free Air Displacement	85.0 Liters/min.	232 Liters/min.
Free Air Displacement	1.41 Liters/sec.	3.9 Liters/sec.
RPM	1135	1000
Motor H.P.	1/3	1/2
Motor RPM (syn.)	1800	1800
Oil Capacity	1½ qts.	2¼ qts.
Shaft Diameter	¾"	¾"
Inlet Connection	¾" Screwed	1" Screwed
Outlet Connection	¾" Screwed	1" Screwed
Net Weight, Complete	80 lbs.	185 lbs.

INCREASE YOUR PROFIT with pumps designed specifically for this type of service. Compact, easy to maintain, and extremely reliable, these pumps operate for extended periods . . . unattended . . . removing water vapor and supplying the ultimate high vacuum required. For lower pressures at faster pumping speeds and rapid recovery rates, specify either the Model KC-3R or Model KC-8R vacuum pump.

HERE'S WHY . . . Model KC-3R design features include: gas ballast, special air-oil separator tank, V-belt drive, 30" Bourdon type vacuum gauge, and condensate trap in discharge line. Ideal for systems up to and including 40 ton size.

Model KC-8R design features include: gas ballast, extra oil capacity, oversize air-oil separator tank, V-belt drive, 30" Bourdon gauge, and dual carrier handle. For larger tonnage (over 40) systems.

Both these high-quality, long-life pumps reflect the years of vacuum pump experience that has made the Kinney line the world's largest. For superior vacuum equipment, contact the Vacuum Equipment Division of The New York Air Brake Company at address below. Our engineers will gladly make recommendations on any of your vacuum equipment requirements. Contact one of our competently staffed district offices . . . in Baltimore, Charleston, W. Va., Charlotte, N. C., Chicago (La Grange), Cleveland, Detroit, Houston, Los Angeles, New Orleans, New York, Philadelphia, Pittsburgh, San Francisco . . . or The International Sales Office, 90 West St., New York 6, N. Y.

write now!

KINNEY MFG. DIVISION
THE NEW YORK AIR BRAKE COMPANY
3610 WASHINGTON STREET • BOSTON 30 • MASS.
INTERNATIONAL SALES OFFICE, 90 WEST ST., NEW YORK 6, N.Y.

- Please send Bulletin 403 describing the Kinney line of air-cooled vacuum pumps.

Name _____ *Title* _____

Company _____

Street _____

City _____ *State* _____

Circle No. 11 on Reader Service Card

Announcing . . . Revised for genetron®

In the interest of helping to standardize refrigerant terminology and nomenclature, General Chemical is adopting the revised code numbers shown above for its "Genetron" Super-Dry Refrigerants, effective January 1, 1957.

These numerical designations reflect recommendations of trade and technical associations throughout the industry which have been working jointly and independently on many standardizations, including a common numerical code system for fluorinated hydrocarbon refrigerants.

The numerals for two of the most widely used "Genetrons" — "Genetron" 12 and "Genetron" 11 — already conform and, accordingly, are not being changed.

Circle No. 12 on Reader Service Card

Code Numbers

SUPER-DRY REFRIGERANTS

. . . in the interest of standardizing refrigerant terminology and nomenclature

PRESENT GENETRON CODE NUMBER	CODE NUMBER TO BE USED EFFECTIVE JAN. 1	COLOR-CODE	REFRIGERANTS
genetron 11	**11**	ORANGE LABEL	**TRICHLOROMONOFLUOROMETHANE**
genetron 12	**12**	WHITE LABEL	**DICHLORODIFLUOROMETHANE**
genetron 141	**22**	GREEN LABEL	**MONOCHLORODIFLUOROMETHANE**
genetron 226	**113**	PURPLE LABEL	**TRICHLOROTRIFLUOROETHANE**
genetron 320	**114A**	DARK BLUE LABEL	**DICHLOROTETRAFLUOROETHANE**

"Genetron" Super-Dry Refrigerants are stocked and recommended by America's leading air conditioning and refrigeration wholesalers. When ordering from them in the year ahead, please use these revised code numbers to designate the "Genetrons" you need.

GENETRON DEPARTMENT

GENERAL CHEMICAL DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 Rector Street, New York 6, N. Y.

Circle No. 12 on Reader Service Card

ABOUT PEOPLE

Robert E. Dyas has been appointed manager of contract refrigeration sales for Perfection Industries Div., Hupp Corp. Dyas joined Hupp in 1948 as service manager of the Refrigeration Products Div., and most recently served in a sales capacity for residential air conditioning products and as director of technical training. He is a member of American Society of Refrigeration Engineers and Refrigeration Service Engineers Society.

•

Jack H. Smith has been appointed director of Copper Div. of the Business Defense Services Administration of the Department of Commerce. Smith assumes his post on a loan basis from Wolverine Tube, Division of Calumet & Hecla, Inc. He has been Wolverine's east-central district sales manager, and now will headquarter in Washington, D. C.

•

William T. Goldsmith, former sales manager of Delta Heating Corp. and heating control sales manager for General Electric Co., has been appointed general sales manager of Ingersoll Conditioned Air Div. of Borg-Warner Corp. Goldsmith will headquarter in Kalamazoo, home of Ingersoll Conditioned Air.

Appointment of **Robert Sandusky** as district manager for the Omaha territory of Janitrol Heating and Air Conditioning Div. of Surface Combustion Corp. has been announced. Sandusky's territory will include Nebraska, Iowa, central and southeastern South Dakota, and northwestern Kansas. He has been associated with Janitrol since 1946 and for the past seven years has been a sales representative in the Columbus district office.

•

F. Kenneth Morrison has been named president and general manager of Mason-Neilan Div. of Worthington Corp. Morrison succeeds Eldon Macleod, who is retiring after 43 years.

•

Miss Louise A. K. Frolich has been appointed food service specialist of Koch Refrigerators, Inc. Miss Frolich previously had been retained by Koch for special jobs as consultant. She will be responsible for the development of applications in the kitchen for commercial refrigerators, plus activity as a consultant, and director of food workshops and training programs for food service groups.

•

R. D. Marshall of R. D. Marshall and Co., Inc., Albany, N. Y., has been appointed sales representative for "PurAir" activated charcoal air purification equipment throughout upstate-eastern New York, southern Vermont, and western Massachusetts, according to an announcement by Barnebey-Cheney Co.

James H. Flowers has been named advertising manager of United States Air Conditioning Corp. Flowers was formerly with General Outdoor Advertising, Landau Advertising, and Hoedt Studios of Philadelphia.

•

Sporlan Valve Co. announces the appointment of **Harold V. (Hal) Clyde** to its field organization. Clyde will open Sporlan's new Cleveland, Ohio, office from which he will service the general Cleveland - Pittsburgh trading area. He is a member of the American Society of Refrigerating Engineers and Refrigeration Service Engineers Society, and has had extensive experience in the field.

•

The appointment of **H. R. Henke** to the newly created post of marketing manager has been announced by Bell & Gossett Co. Taking over Henke's former position as advertising manager will be **George U. Miller,** currently advertising manager for Marlow Pumps, a division of Bell & Gossett Company.

•

Donald J. Wood has been appointed general sales manager for Evansville Div. of Bendix-Westinghouse Automotive Air Brake Co. Wood previously was an appropriations analyst for American Steel and Wire Co., and sales manager for Duval Engine and Equipment Co. In 1953, he joined Titan Valve and Mfg. Co., and held positions of sales engineer, sales manager, vice president and gen-

A low priced, dependable control for liquid, air and surface temperature

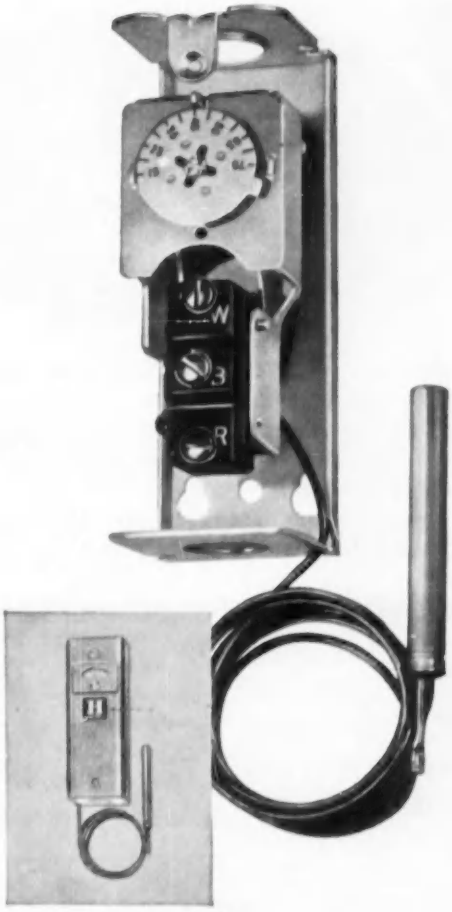
the New Honeywell Refrigeration thermostat

WITH THE NEW L6021 refrigeration thermostat, Honeywell offers you a complete line of refrigeration temperature controls. The remote bulb thermostat gives you low-cost, dependable control of air, liquid and surface temperature. And its built-in versatility means you can satisfy a wide range of uses—and simplify inventories.

For information on the L6021 or on any of our complete line of heating-cooling controls, call your local Honeywell office. Or write Honeywell, Dept. CR-12-272, Minneapolis 8, Minnesota.

These features make the New Refrigeration thermostat the leading choice for all types of cooling applications

Faster response—No "lag" in response; no swings in cycling pattern • ***"Repeatability"***—Holds temperature setting you choose • ***Enclosed Micro Switch***—For trouble-free action • ***Close control***—Holds temperature within a 2°F range • ***Smaller remote bulb*** • ***Easy installation*** • ***Available with or without case.***



MINNEAPOLIS **Honeywell**

112 offices across nation

First in Controls

For frozen food cases, the L6021 is safe, sure, dependable and economical.

For beverage dispensers, it holds temperature constant for better taste.

For ice makers, the L6021 gives closer control for more efficient operation.

For meat and vegetable cases, the L6021 has close control to avoid spoilage.

Circle No. 13 on Reader Service Card

eral manager. He comes to Evansville from the home plant of Bendix-Westinghouse in Elyria, Ohio, where he was sales manager of the company's air conditioning department.

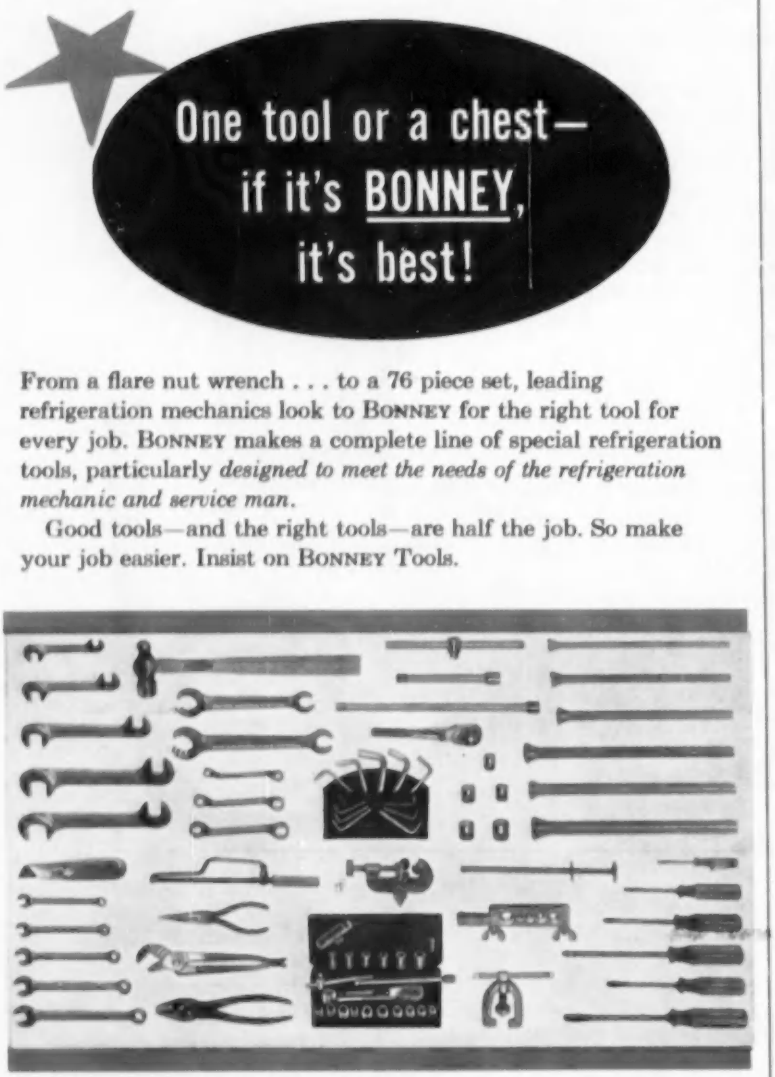
•

John G. Reid has been named engineering manager, absorption systems, of Industrial Div. of the York Corp. Reid comes from Crosley and Bendix Home Appliances Div., Avco Mfg. Corp. At Avco, he was manager of air conditioning engineering for five years following 11 years as mechanical research engineer on absorption systems at Servel, Inc. He is a member of American Society of Refrigerating Engineers.

•

Three regional sales appointments have been made by Unarco Air Conditioning Products, National-U.S. Radiator Corp. **William G. Huston** takes over as western manager with headquarters in San Francisco. **John T. Obrig** will work out of New York City as eastern head. **A. L. Hospers** will operate the south-southwest branch, and will headquarter in Atlanta, Ga. All three men occupied these same positions with the Unarco organization before its acquisition by National-U.S.

•



From a flare nut wrench . . . to a 76 piece set, leading refrigeration mechanics look to BONNEY for the right tool for every job. BONNEY makes a complete line of special refrigeration tools, particularly *designed to meet the needs of the refrigeration mechanic and service man.*

Good tools—and the right tools—are half the job. So make your job easier. Insist on BONNEY Tools.

Illustrated: Bonney Tool Set No. RF-85

BONNEY FORGE & TOOL WORKS
ALLIANCE • OHIO

BONNEY TOOLS

Circle No. 14 on Reader Service Card

R. L. Kirse Jr. has been appointed service manager of United States Air Conditioning Corp. Kirse was formerly assistant service manager of All Year Air Conditioning Div. of Servel, Inc., and prior to that was supervisor of air conditioning installations for Gulf Oil Co.

•

Sherman Loud has been named sales manager-national accounts for York Corp. Loud formerly was York's national account representative for the North Atlantic district. Before joining York he was sales manager with Mainco Air Conditioning & Refrigeration Co. Prior to that he was New York district sales engineer for Trane Co. He is a member of American Society of Heating & Air-Conditioning Engineers and American Society of Refrigerating Engineers.

•

Wallace H. Hoeing, former sales manager of the Air Conditioning Div., Servel, Inc., Evansville, Ind., has been named sales manager of the overall sales organization of Brunner Mfg. Co., and its Gainesville, Ga., subsidiary,

Brunner Co. **A. G. Zumbrun Jr.** has been transferred from the Gainesville plant to the home office where he becomes supervisor of sales, Utica refrigeration. **Paul A. Hunker,** formerly headquartered in Utica, has been appointed supervisor of sales, hermetic division, and transferred to Gainesville.

•

Morris P. (Morry) Stillinger, has joined General Controls Co. as a sales engineer in the Los Angeles territory. Stillinger will service original equipment manufacturers. His control experience includes positions with Southern California Gas Co., Carrier Corp., Robertshaw Fulton, and Weatherhead Co.

•

Appointment of **William L. Hullsiek** as merchandising manager for Kelvinator Div. of American Motors Corp. has been announced. Hullsiek joined Kelvinator in 1945 as a district manager with the Minneapolis zone office. He has been advertising and sales promotion manager and served as assistant general sales manager of Altorfer Brothers Co., Kelvinator's laundry products subsidiary in Peoria, Ill., and as manager of sales planning for Kelvinator refrigeration products before assuming his most recent post as laundry equipment sales planning manager in 1955.

•

Promotion of **James F. Pichiotino** to area sales manager of the midwest area office of Redmond Co., Inc., has been announced. Pichiotino formerly was sales engineer in charge of the midwest area sales office at Oak Park, Ill. He has been with Redmond for 12 years.

•

Stanley J. Roush has been appointed to the newly created position of group vice president of Borg-Warner Corp. Divisions of the corporation will report directly to Roush. He also will retain his present positions as president of the Atkins Saw Div. of Borg-Warner in Indianapolis and president of Morse Chain Co., a subsidiary, in Ithaca, N. Y., and Detroit. He was president of Kerotest Mfg. Co. prior to joining Borg-Warner in September, 1952.

•

Robert H. Lowe has been named advertising and sales promotion manager of Coleman Co., Inc., succeeding Julian F. Warren who has resigned to establish his own wholesale distributing com-

LIKE A DUCK TAKES TO WATER!

You rarely think of ducks without thinking of water. Their entire physical structure, from web feet to bill, is built for life in the water, and finding water is the natural instinct of a duck.

Thawzone, the travelling dehydrator, also "searches out" water... in refrigeration units.

Thawzone not only finds but also destroys every trace of water in a matter of minutes ... and time is of the essence in a busy engineer's life.

CONSIDER THESE THAWZONE ADVANTAGES:

1. Actually destroys moisture ... not a mere anti-freeze.
2. Scavenges oxygen ... helps to overcome the harmful effect of traces of oxygen which may remain in a refrigeration system after the usual purging.
3. Cannot cause pressure drop.
4. Does not release moisture when temperature changes.
5. May be used in open or hermetic units containing any of the "Freons", methyl chloride, methylene chloride or isobutane.
6. Costs only about 8 cents per lb. of refrigerant treated. Used in minute amounts.

Why don't you try a 1 oz. bottle of Thawzone? Also available in 4 oz. and pint bottles. Call your wholesaler.

THAWZONE®

The Only Product That DESTROYS Water ... and Reaches ALL of it

Stewart Industries, Inc.

(Formerly HIGHSIDE CHEMICALS CO.)

4 Colfax Avenue, Clifton, N. J.

Circle No. 15 on Reader Service Card

pany in Houston, Tex. **A. M. (Tony) Castello** has been appointed sales engineering manager of Coleman. Lowe joined the company in 1955, as promotion manager of the utilities operation department. Since joining Coleman in 1953, Castello has been technical service manager of the utility operations department and manager of the outside contracts division.

•

Chemical Solvent Co., announces the appointment of **Rudy Wolfe** and **Walter Evans Jr.,** as its sales representatives in Louisiana, Texas, Oklahoma, Arkansas, Mississippi, Tennessee, and parts of Alabama. The two men recently opened their own sales agency in New Orleans under the name of Wolfe and Evans Co.

•

Packless Metal Hose, Inc., has appointed **E. S. Johnson** as its new sales representative covering the northern midwest area.

•

A. C. Hoffbauer has been appointed manager of a new branch office in Kansas City, Mo., by Jamison Cold Storage Door Co., Hagerstown, Md. The office is located in Room 322 Ten Sixteen Baltimore Bldg., Kansas City 6. Hoffbauer will serve the company in the greater Kansas City area, the state of Kansas, and the western half of Missouri.

•

Addison Products Co., announces the appointment of **R. C. "Robbie" Robertson** to direct its sales activities in Chicago and surrounding territory, with offices established in Lake Forest, Ill. Prior to joining Addison he served four years as marketing manager of the Home Heating and Cooling Div. of General Electric Co. He is a member of American Society of Refrigerating Engineers.

HERBERT G. STEPHAN has been named supervisor of execution engineers, a newly created position, by Airtemp Construction Corp. In this capacity he will coordinate the work of sub-contractors and oversee job progress on the major air conditioning contracts handled by this firm. Prior to joining Airtemp Construction recently, Stephan served as construction superintendent of McCrory Stores' Inc.

T. A. Crawford has joined York-Shipley, Inc., as director of marketing. Crawford has had more than 30 years with Timken Silent Automatic in various managerial and sales positions.

•

LaCrosse Cooler Co., has announced the appointment of **Ralph Binkerd** as its agent for the states of Indiana and Ohio. Binkerd will work out of Peru, Ind.

•

Edmund G. Seergy has been appointed manager of national account sales for Typhoon Air Conditioning Co., Div. of Hupp Corp. Seergy served as division manager and sales engineer with Frigidaire sales Corp., Div. of the General Motors Corp. for eight years, and previously had been associated with Fedders-Quigan Corp. and McCray Refrigerator Co. He is a member of American Society of Refrigerating Engineers.

•

Three vice presidential changes have been announced by Perfection Industries Div., Hupp Corp. **Daniel N. Gredys** has been elected vice president in charge of engineering. **H. A. Consor** becomes vice president of manufacturing at the company's Cleveland plant. **John Gardner** has been elected vice president of manufacturing at Waynesboro, Ga.

•

Charles A. Barnes, assistant secretary and assistant treasurer of York Corp., prior to its merger with Borg-Warner Corp., has been promoted to assistant to Albert Steg, financial vice president and treasurer of Borg-Warner, at its headquarters in Chicago. Previously, Barnes was assistant secretary and assistant treasurer of York Corp. for five years.

•

Merle W. Semisch has joined Pennsylvania Salt Mfg. Co. as southern district manager of the company's Isotron refrigerants sales. From headquarters in Decatur, Ga., Semisch also will supervise activities of manufacturers representatives handling Isotron refrigerants. He was a manufacturer's representative in the southern states prior to his affiliation with Pennsalt.

•

Frank L. Early has been named regional manager for the southwest area, for Gibson Refrigerator Co., Div. of Hupp Corp. Early will cover the states of Texas, Oklahoma, and New Mexico. He replaces R. R. Clarke who resigned.

Put 'em together in seconds... to serve for years!

CHASE COPPER REFRIGERATION TUBE AND SOLDER-JOINT FITTINGS make the perfect pair for longer wear. Chase solder-joint fittings fit Chase tube accurately! Expand and contract as one leak-proof, pressure-tight unit. When assembled, they have no shoulders or rough inside edges, insuring you of smooth refrigerant flow. And you get Chase tube and fittings ready for assembly—clean, bright and flawless!

Your Chase Wholesaler has complete stocks. Contact him today.

Chase

BRASS & COPPER CO.

WATERBURY 20, CONNECTICUT
SUBSIDIARY OF KENNECOTT COPPER CORPORATION

The Nation's Headquarters for Brass, Copper and Stainless Steel

Atlanta Baltimore Boston Charlotte Chicago Cincinnati Cleveland Dallas Denver Detroit Grand Rapids Houston Indianapolis Kansas City, Mo. Los Angeles Milwaukee Minneapolis Newark New Orleans New York Philadelphia Pittsburgh Providence Rochester St. Louis San Francisco Seattle Waterbury

Circle No. 16 on Reader Service Card

Today—Join American Blower's

Modern styling for modern businesses! New 1957 American Blower Packaged Air Conditioners come in sizes for *all* commercial jobs. Every business is a prospect – offices, stores, restaurants, showrooms, small industrial plants. Join American Blower's big sales-maker program now. Profits are assured – you can stake your future on it!

Circle No. 17 on Reader Service Card

Big Sales-Maker Program!

Sell new 1957 comfort-engineered Packaged Air Conditioners

The franchise with the future! Right now, not next spring or summer, is the right time to step into the wide-open, growing air-conditioning business.

With American Blower, you're backed by one of the most respected names in the industry – a leader in air-handling and conditioning for more than 75 years. You build for the future with the product customers want: the most modern packaged air conditioners on the market.

You have the kind of factory support that assures your success, with power-packed advertising, merchandising aids . . . sales training, warehousing plan – a complete sales-maker program!

Most modern units on the market! 1957 American Blower Packaged Air Conditioners are *all-new*, and tastefully styled to blend with any décor. There are sizes to fit *any* commercial job: 3 ton to 20 ton; install with ductwork or handsome plenum section. And you offer a 5-year factory warranty on the refrigeration circuit – a big American Blower sales-maker!

Thorough sales training! You get a full factory course on how to sell and service modern American Blower Packaged Air Conditioners. You learn the product in and out from skilled American Blower engineers. You learn how to sell them, who to sell them to, how to make installations – a big American Blower sales-maker!

Compelling national ads pave the way! Full-page ads in national magazines, like *The Saturday Evening Post*, *Newsweek*, *Business Week*, help to presell your customers for you – a big American Blower sales-maker!

Co-operative advertising plan! You get a complete advertising kit that tells you how to make the most of local advertising; gives you full, step-by-step instructions on preparing your own ads; contains ready-made ad-mat and product reprints; offers radio spot announcements, TV commercials; tells you how to order. And American Blower helps you pay for your advertising – a big American Blower sales-maker!

Colorful sales-promotion material! You get a complete sales package for prospecting by mail and at point of purchase; product-line folders, wall posters, direct-mail pieces, envelope stuffers, sample sales letters, customer brochures – a big American Blower sales-maker!

Hurry – installations are passing you by right now! Forward-looking businessmen are already looking around for air conditioners to beat the spring installation tie-up. So act today! Get in on profits *now* with American Blower's big sales-maker program. Clip and mail coupon for complete details. American Blower Division of American-Standard, Detroit 32, Michigan.

DISTRIBUTORS: There are still choice territories open for aggressive, well-qualified distributors to handle new American Blower Packaged Air Conditioners. Send for franchise data today!

AMERICAN BLOWER

Division of AMERICAN-Standard

THE FRANCHISE WITH THE FUTURE

American Blower
Division of American-Standard
Detroit 32, Michigan

Yes! I am interested in becoming a ☐ dealer ☐ distributor for American Blower Packaged Air Conditioners. Please have your representative call.

Name_____

Firm_____

Address_____

City_____ Zone_____ State_____

Circle No. 17 on Reader Service Card

the hottest thing in LOW temperature

LOWEST in operating costs, too! Kramer's new "L" THERMOBANK saves important dollars every day it works for you. It's the only LOW temperature automatic hot gas defrost system that works trouble-free at any temperature level, from plus 32° to minus 75°. Let us prove that it costs less to own the best!

WRITE FOR MANUAL TV-320

KRAMER **THERMOBANK**

KRAMER TRENTON COMPANY
Trenton 5, New Jersey

Circle No. 18 on Reader Service Card

Right to left: John Morrill, General Manager—Don Wood, General Sales Manager—Al Wirick, Manager of Manufacturing—Clyde Ploeger, Director of Engineering—Bill Aulsebrook, Manager, Quality Control—Hardy Austin, Superintendent, Production—John Dawnen, Service Manager—Clarence Martin, Supervisor, Order Department—Henry Preher, Chief Application Engineer

NEW TEAM IN THE COMPRESSOR LEAGUE!

There's a new big-league team in the compressor business—Bendix-Westinghouse Evansville Division.

While our parent company, Bendix-Westinghouse Automotive Air Brake Company, has been for twenty-five years the leading supplier of precision compressors to the automotive industry, our division here at Evansville, Indiana, is a brand-new entry into the commercial refrigeration and air-conditioning field.

Our product line consists of hermetic compressors ranging in capacity from ¾ to 7½ H.P. They're designed for low, medium, and high temperature applications, and we believe them to be unsurpassed for dependable performance.

Our manufacturing facilities are big, modern, well-staffed and well-tooled. They can handle any size order you give us.

Our personnel know the business and are dedicated to carry out our main policy . . . to provide you with the finest products and best service available. We want your business and will contact you soon to show you specifically what we have to offer.

NOT IN APPLIANCE BUSINESS

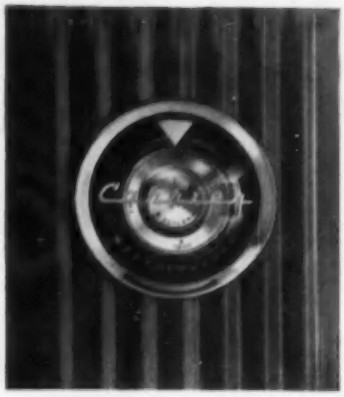
Our name may lead you to believe we also are in the appliance business. Neither this division nor the parent company in Elyria, Ohio, has any connection with appliance manufacturing. We make compressors and condensing units, nothing else. Bendix-Westinghouse is a joint subsidiary of Bendix Aviation Corporation, Detroit, Michigan, and Westinghouse Air Brake Company, Wilmerding, Pennsylvania.

Bendix-Westinghouse

EVANSVILLE DIVISION *Evansville, Indiana*

A Division of Bendix-Westinghouse Automotive Air Brake Company, Elyria, Ohio

Circle No. 9 on Reader Service Card



New Golden Aerodial. It's 22-karat gold-plated and beautiful. Lucite dome hinges over main control, thermostat knob and reset button. Easy reset reduces service calls.

the all-new, all-around air conditioner designed for lower installation costs!

NEW CARRIER WEATHERMAKER

Here's the first self-contained air conditioner designed for lower installation costs—with or without ductwork. Check these exclusive new time-and-trouble-saving features:

ADAPTABLE five-way air return. Duct return through bottom or back. Or matching pedestal base can be added so air returns at front or sides.

PRE-WIRED electrical center. All connections are made in one outlet box at the side. No additional internal electric wiring is necessary.

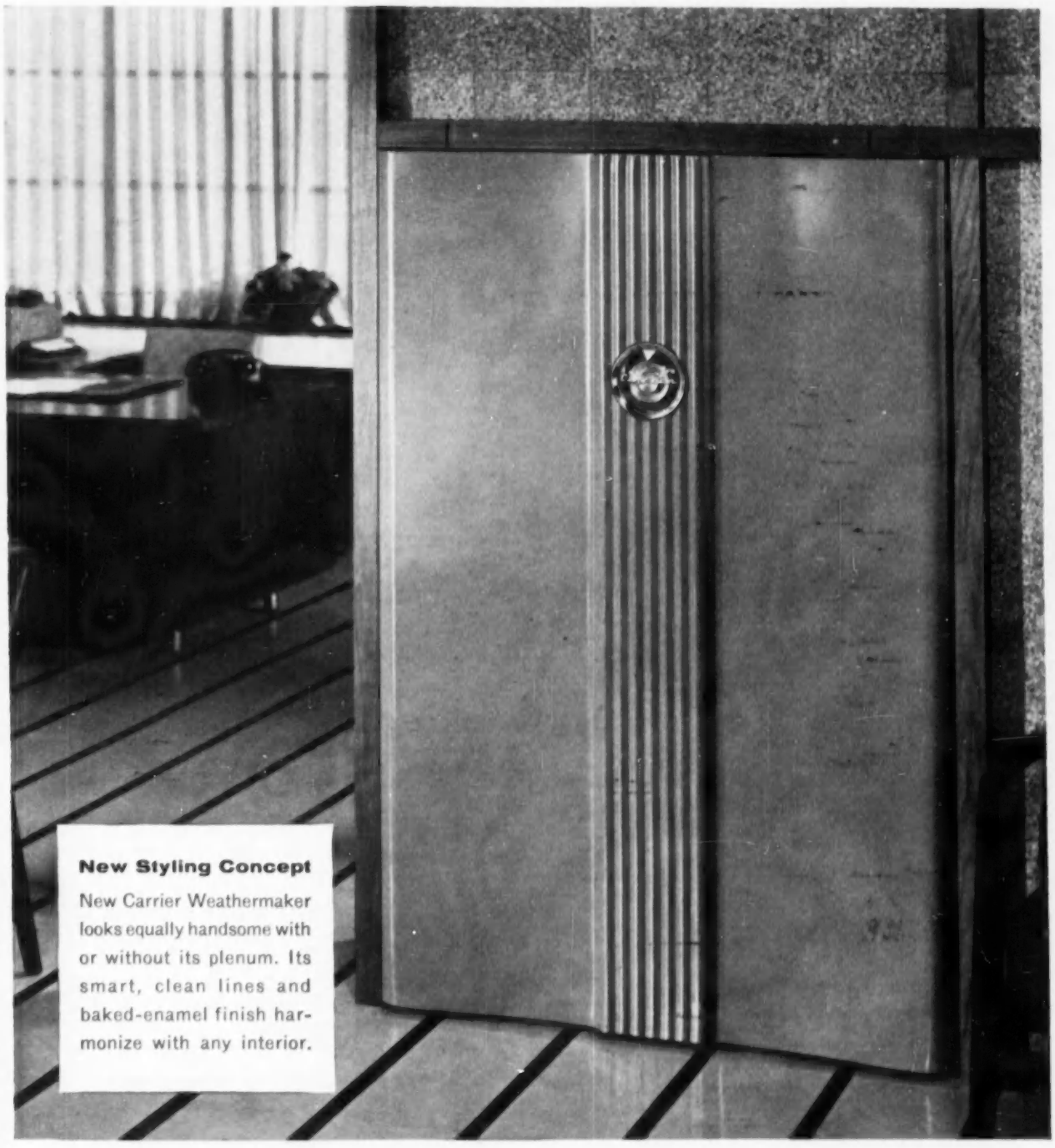
EXCLUSIVE solid front panel. No return air grille to block off for duct jobs. Snap locks release panel for easy access. No tools are needed.

EXTRA-LARGE add-on plenum. Easily mounted for installations not requiring ductwork. Hinged grille panel is counterbalanced for easy access. Full directional air control.

ALTERNATE fan discharge. L-shaped fan platform easily inverted for rear discharge where headroom is low. You avoid costly cutting and patching of unit in changing flow.

BUILT-IN PROVISION for heating coil. No need to alter unit when you add matching heating coil—uses either steam or hot water to heat the same area cooled by unit.

Circle No. 20 on Reader Service Card



New Styling Concept

New Carrier Weathermaker looks equally handsome with or without its plenum. Its smart, clean lines and baked-enamel finish harmonize with any interior.

FREE CATALOG!

Full details and complete specifications on the new Carrier Weathermaker. Just mail the coupon.

CARRIER CORPORATION, 321 S. Geddes Street, Syracuse, New York

I'm interested in your new Weathermaker and want to see the specs. Please rush me a catalog.

Name _____

Firm _____

Address _____

City _____ Zone _____ State _____

Circle No. 20 on Reader Service Card

LOOK!... 3 good reasons why your cold-room walls need J-M Asbestocite

This typical cold storage scene at the Long Beach (California) Seafoods Company helps explain the trend to Asbestocite® sheets as a protective finish over refrigeration insulation.

Take the liftruck, for example.—

It symbolizes the kind of rough service for which Asbestocite is designed. This doesn't mean that liftrucks should be smashed into Asbestocite walls. But short of this, you'll find Asbestocite will withstand literally decades of hard usage.

. . . and the fish.—

This is one of many foods that give off strong or offensive odors. Here Asbestocite really pays off! It won't pick up odors to contaminate delicate foodstuffs. And it cleans quickly, easily with ordinary soap and water.

. . . and the wall appearance.—

Neat, attractive walls of Asbestocite encourage cleanliness, pass the most critical inspection. Asbestocite never needs protective coatings—simply will not rot, corrode or burn.

For further information, write to Johns-Manville, Box 14, New York 16, N.Y.

Comes in large, easy-to-handle sheets

Asbestocite is made of asbestos and cement formed under high pressure. It is attractive, natural gray in color and has a hard, smooth finish on one side. Available in sheet sizes up to 4'x12' . . . in thickness up to ½".

Short Specifications for typical cold-room wall

Insulated Cold Room Finish. Shall be $\frac{3}{16}$" thick Johns-Manville Asbestocite secured to treated wood nailers with wood screws or to T-bars by means of clips as the case may be.

Refrigeration Insulation. Shall be Johns-Manville Rock Cork sheets —" thick, installed in two layers using Rock Cork asphalt or other approved adhesive. The second layer shall break all joints with the first.

Johns-Manville Rock Cork refrigeration insulation has been the choice of refrigeration engineers everywhere for over half a century. It offers these advantages: High moisture resistance—sanitary, odorless service—low conductivity—long service life—top structural strength.

Johns-Manville *first in* INSULATION

MATERIALS · ENGINEERING · APPLICATION

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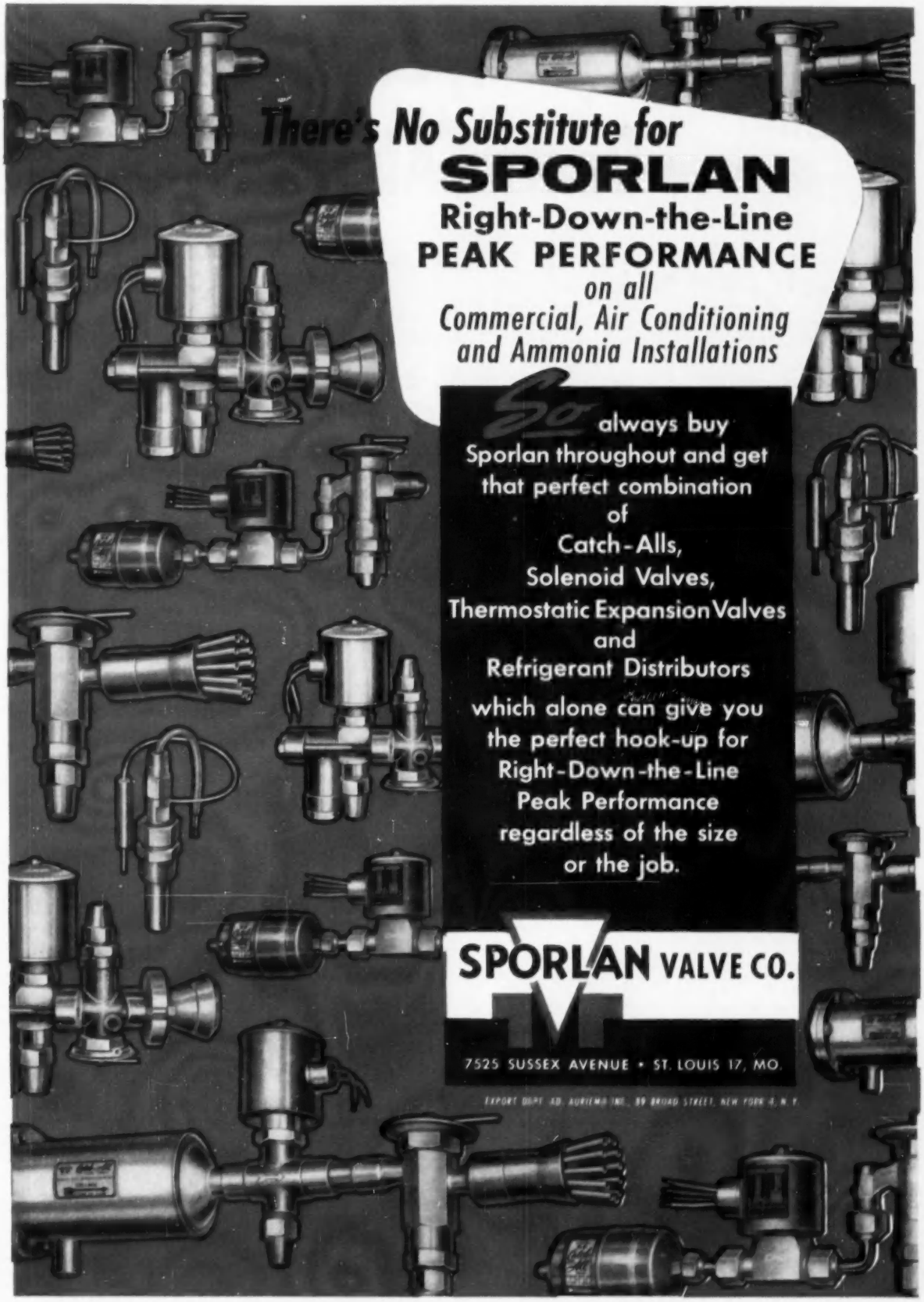
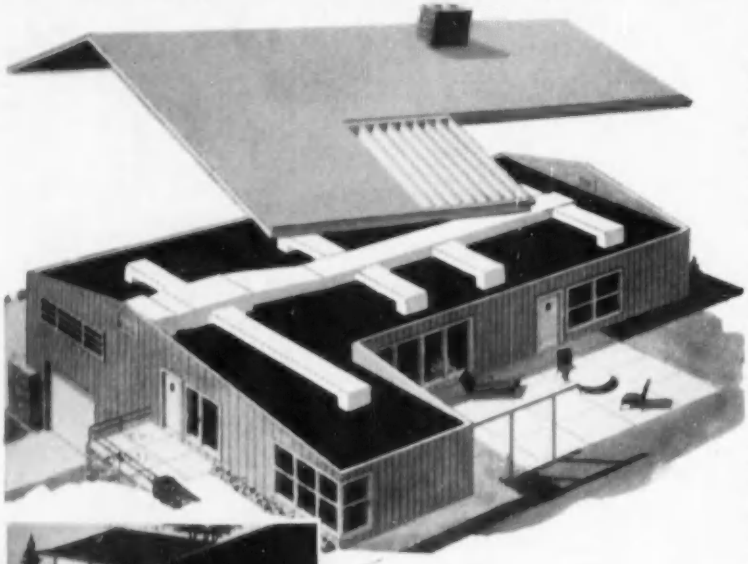


Circle No. 22 on Reader Service Card

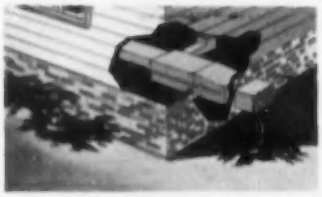
NEW FROM YORK

First Really Low Cost Answer to Central Air Conditioning!

Amazingly compact York Pathfinder Units let you put central air conditioning in homes costing as little as $12,000. Opens doors for installations in stores, offices and larger buildings as well!



FITS TINY SPACE—turns attic into cooling headquarters. Even a dormer installation for hip and low roofs.



INSTALLS ANYWHERE—through wall to basement or crawlspace.

Low Cost...High Profit

Now, York puts central air conditioning on a mass market basis with a sensational new unit that can be advertised for less than $500. Here is something you can really get your teeth into ...really sell...to realize the tremendous profits that are ready and waiting in this great new growth industry.

Add to this price story the quality and compactness of this new unit—that permits installation almost anywhere there's a few feet of waste space. Then add the pre-fabricated, pre-insulated ductwork that turns days of installation into hours and you'll see the tremendous profit possibilities.

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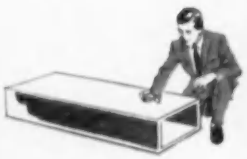
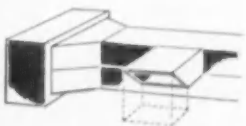
PREFABRICATED DUCTWORK...EASY AS ABC

A Flat fiberglass duct can be knife-cut to any length



B Easily formed by simply folding on pre-scored lines



C Risers easily connected to main duct and sealed

Duct is ¾" fiberglass with vinyl coating on inside and reinforced aluminum foil vapor seal on outside.

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York refrigeration air conditioning

The quality name in air conditioning

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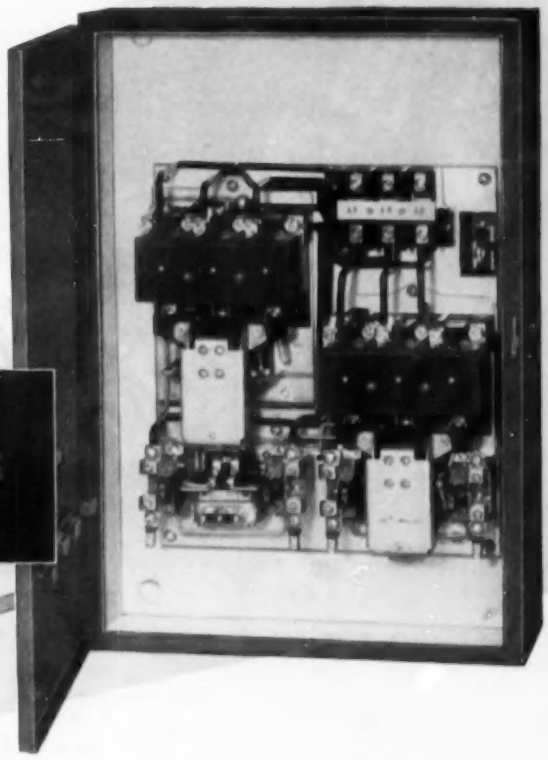

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** Part winding starters arranged for 440 volts are also available*

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NON-FLAMMABLE • LIQUEFIED GAS UNDER PRESSURE
CYLINDER HANDLING AND STORAGE: Store out of sun and away from heat.
Keep valve tightly closed. Never drop or refill cylinders.
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...on Pennsalt's new refrigerants

ISOTRON

THE KEY TO MODERN LIVING

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A pioneer and leader in modern fluorine chemistry, Pennsalt stands squarely behind the new ISOTRON line. ISOTRON products are COMPLETELY INTERCHANGEABLE with other reputable fluorinated refrigerants. They're of precisely the same formulas as the other products of this kind, and will be manufactured in a modern new plant with the rigid quality control you expect of Pennsalt. ISOTRON refrigerants will be packed at the plant in all standard containers.

INVESTIGATE THE ISOTRON LINE! Benefit from Pennsalt's advanced thinking and welcome *service*, which will be available nationwide to refrigeration service contractors and wholesalers as well as to original-equipment manufacturers. For further information on ISOTRON refrigerants, write Isotron Chemicals Dept. 359, Industrial Division, Pennsylvania Salt Manufacturing Company, Three Penn Center Plaza, Philadelphia 2, Pa.

*ISOTRON IS A TRADEMARK OF THE PENNSYLVANIA SALT MFG. COMPANY

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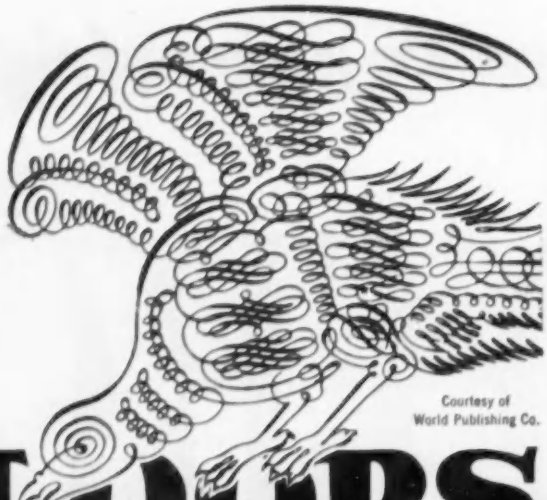

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Spray Pond Article Made Lasting Impression

EDITOR:

Approximately 18 months ago your magazine published an article on the use of spray ponds used for decorative purposes in lawns from the water used to cool air conditioning equipment. This article gave instructions for the construction of such ponds.

We have lost our magazine and would appreciate very much obtaining another copy if it is available. I think it is the March 1955 issue.

F. E. SOMMER
Sommer Refrigeration Co.
Topeka, Kans.

Time really flies! This article on the use of spray ponds appeared in our September 1953 issue. A tearsheet of this article was sent to Mr. Sommer, along with another article from our December 1954 issue telling how one contractor combined an outdoor swimming pool with an air conditioner as a means of saving condenser water for re-use.

* * *

Reader Values Legal Information Column

EDITOR:

I have been receiving your magazine thru the courtesy of Larson Supply Company, and this is deeply appreciated.

I look forward to getting same each month, and read it carefully. I have found it to be very helpful and constructive. I pay special note to your column "It's The Law". Thank goodness I have never experienced any such difficulty till this time, but one never knows what the future has in store for one.

It has struck me that maybe you might have for distribution a series of these items for the past number of years compiled for reference purposes. If such is available I would like to have same, and will pay you

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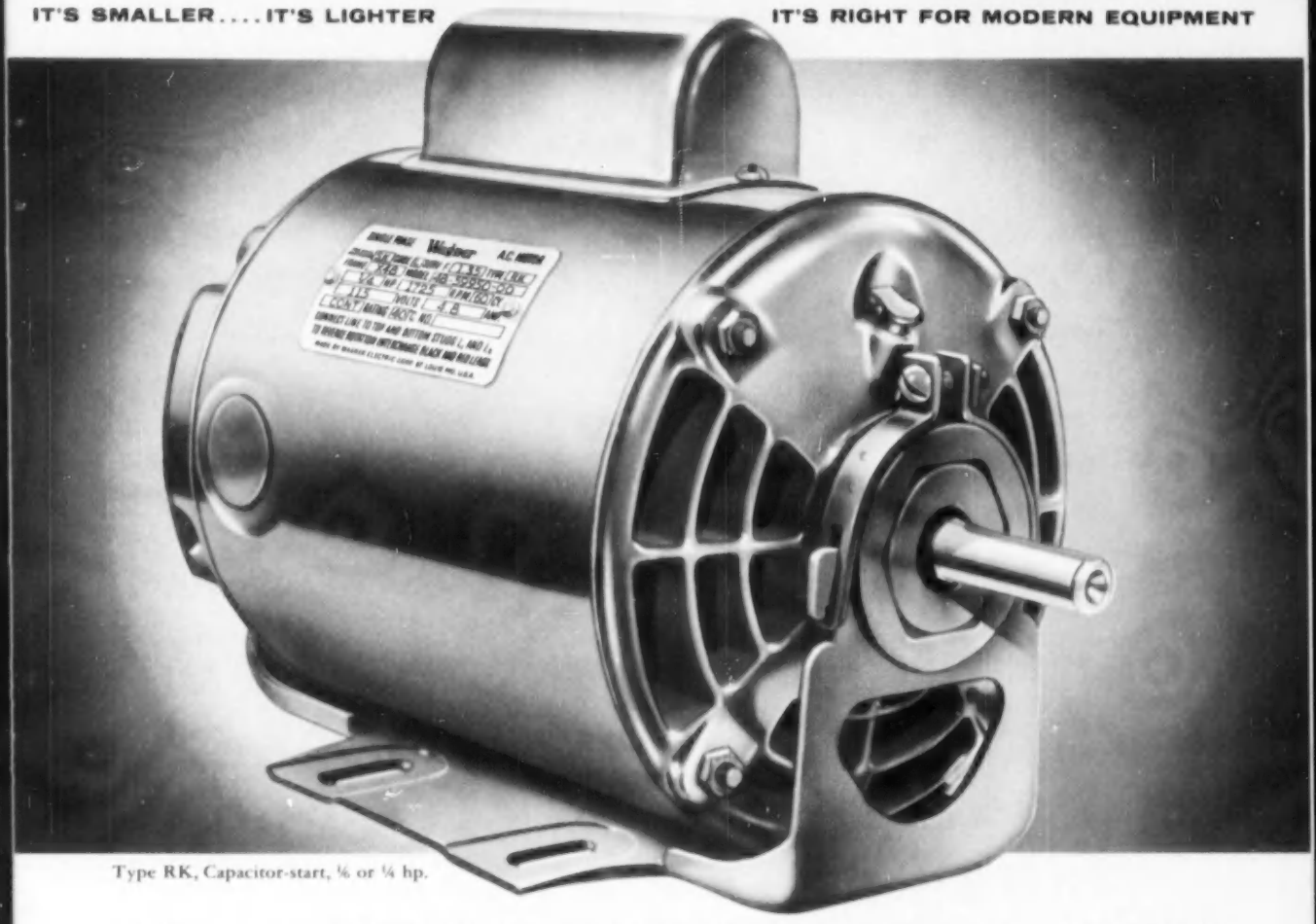
IT'S SMALLER....IT'S LIGHTER

IT'S RIGHT FOR MODERN EQUIPMENT



Type RK, Capacitor-start, ⅙ or ¼ hp.

the WAGNER "48"

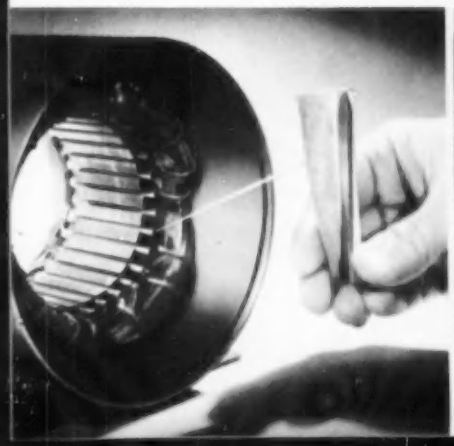
new fractional horsepower motor

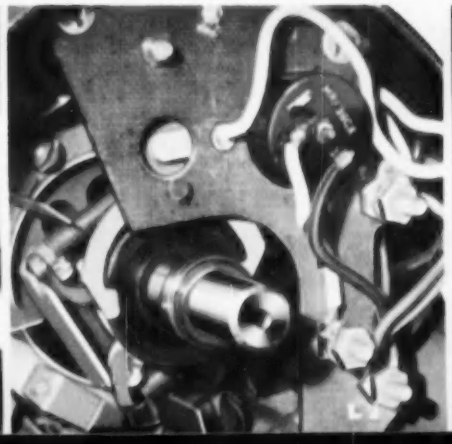
Here's the 48 frame motor you've been looking for! The Wagner "48" comes with either resilient or rigid base . . . capacitor-start or split-phase type. You get the standard 48 frame size—with from *three* to *eight* pounds less weight per motor than previous models in the same hp ratings! The Wagner "48" is easier to handle . . . to stock . . . to install. Yet it's packed with Wagner quality—a known value for more than 65 years.

MYLAR*-PAPER LAMINATED SLOT INSULATION combines top moisture resistance with high dielectric strength and thermal stability—gives the Wagner "48" more application versatility, longer life, when unexpected overloads occur. *DuPont trade mark.

QUICK BREAK SWITCH, that disconnects the starting winding and capacitor from the line at a predetermined speed, makes and breaks with minimum arcing —is dependable and trouble-free.

BABBITT LINED BEARINGS give *smooth* performance. They stand heavy pressures with low temperature rise, have superior anti-seizure and non-scoring characteristics, are corrosion-resistant.





ALL ANGLE OPERATION. You can mount the Wagner "48" at any angle. A new lubrication system assures positive protective lubrication in any position.

LIGHT WEIGHT STEEL FRAME, precision-machined for accurate endplate fit, combined with CAST ALUMINUM ENDPLATES, gives the "48" strength with light weight.

EASY TO CONNECT. Just loosen one screw for access to terminal board. **EASY TO SERVICE** . . . no need to disconnect leads when removing endplates.

solves problems for the design engineer

For design engineers who've been looking for light weight, fractional horsepower motors with less bulk—here's good news!

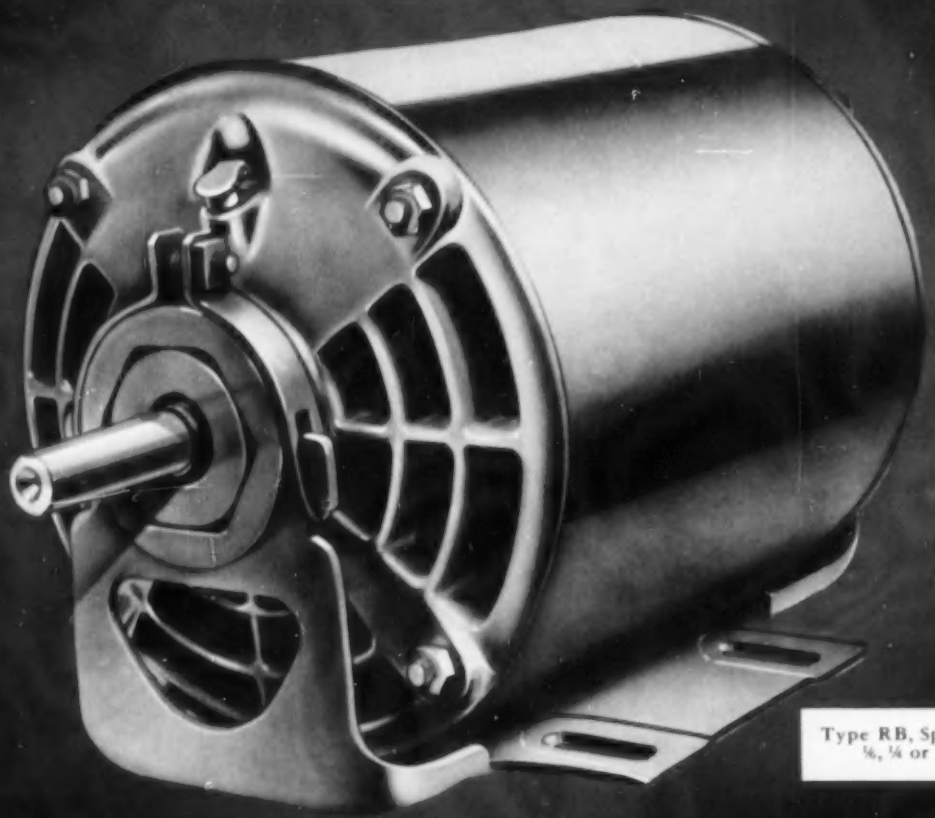
Wagner "48" capacitor-start or split-phase motors are rugged enough to permit direct mounting, are compact enough to fit in tight spots, are exceptionally light in weight, and operate efficiently when mounted at any angle. Both types are available with resilient bases or with rigid bases that are *welded* to the steel motor frames to provide great strength. Through ventilation assures cool running motors that last longer.

If you would like to test the new Wagner "48," one of our field engineers will be glad to furnish a sample motor. Contact the Wagner Branch near you or write us.

WAGNER ELECTRIC CORPORATION . . . 6400 Plymouth Avenue, St. Louis 14, Missouri

M56-16

the WAGNER "48"



Type RB, Split-phase, ⅙, ¼ or ⅓ hp.

for them, if not in binder form, will gladly make it up myself.

I had been saving your magazine for a long time, but thru an oversight by one of our men they were destroyed. This I deeply regretted, and sure wish that replacements were available. May I ask what you can do about this?

HENRY COHEN
United Butcher & Grocery Equip. Co.
Reading, Pa.

Unfortunately, we never have made a practice of collecting or reprinting the material contained in the "It's the Law" column in any other form than it appears in the magazine. Consequently, tear sheets of this department from past issues would be the only means of bringing such a collection up to date.

* * *

Seeks Information for Produce Icing Prospect

EDITOR:

While reading my copy of the June 1956 COMMERCIAL REFRIGERATION & AIR CONDITIONING Magazine, I ran across the article "Producing Ice Is Big Business".

I have a customer who is interested in an installation very similar to the one you referred to in your article. If possible and if you would be so kind, I would like to know the name and manufacturer of the ice blowing equipment and any other equipment relative to the installation.

I would like to know such things as: What kind of hopper is used? What kind of blower? What kind of hose?

I would appreciate any and all information you can pass on to me.

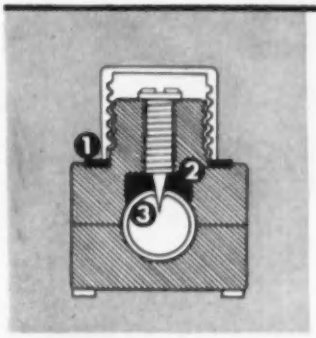
EDWARD D. PULLEN
Dealers Supply Co.
Rapid City, S. D.

We do not know the name of the manufacturer of any of the equipment other than the refrigeration units, which were manufactured by York. However, we are listing below a number of manufacturers who do make ice blowing and crushing equipment.

Gifford-Wood Co., Hudson, N. Y.; Champion Line Machinery Co., North Arlington, N. J.; Link-Belt Co., Chicago, Ill.; Jeffrey Mfg. Co., Columbus, Ohio; Reco Products Div., Recony Corp., New York, N. Y.

NEW... A 5/8" SIZE HAS BEEN ADDED TO WATSCO'S TIME AND MONEY SAVING

LINE-TAP VALVES



Maximum protection 3-point sealing.
1. Knurled cap plus rubber gasket.
2. Needle shoulder plus 2nd gasket.
3. Needle seats as it pierces line.
CAN'T BEND OR CRIMP TUBING

CV-1 CONTROL VALVE
Designed expressly for use with Line-Tap Valve as well as Line-Port and Can-Tap Valves.

PATENTS APPLIED FOR

NOW 6 SIZES
to give complete versatility on every job

ONE PRICE—REGARDLESS OF SIZE

Part No. LT-3 . . for 3/16" tubing
Part No. LT-4 . . . . for 1/4" tubing
Part No. LT-5 . . for 5/16" tubing
Part No. LT-6 . . . . . for 3/8" tubing
Part No. LT-8 . . . . . for 1/2" tubing
Part No. LT-10 . . . . for 5/8" tubing

WATSCO, ALWAYS FIRST IN THE FIELD provides a Line-Tap Valve for every job with the addition of the NEW LT-10. Small and compact, these tapping valves are easily installed. Here's an inexpensive port for discharging, charging or testing. Watsco's valves have no top-heavy assembly . . . will not loosen or leak due to machine vibrations.

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STYROFOAM	✓ Permanently Low. Avg. 0.25	✓ Remains Dry and Assures Constant "K" Factor	✓ Highest Strength-Weight Ratio of Any Insulation	✓ Lightest of All Rigid Insulations. Avg. Density, 1.8 lbs. per. cu. ft.	✓ Pleasant—Fabricates Easily with Common Tools. Doesn't Crumble	✓ Has No Food Value	✓ Lowest Cost, Too, Per Year of Service
INSULATION A		✓	✓			✓	
INSULATION B	✓			✓			
INSULATION C	✓		✓				

For further information on handling Styrofoam, contact your nearest distributor or write direct to Dow Plastics Sales Department **PL507C-1** THE DOW CHEMICAL COMPANY, Midland, Michigan. Western Foam Products, Inc., Colma, Calif. • Pacific Foam Products Co., Los Angeles 13, Calif. • The Putnam Organization, Inc., Chicago, Ill. • Seward Sales Corp., Elkhart, Ind. • Styro Products, Inc., Kansas City, Kansas • Atlantic Foam Products Co., Ipswich, Mass. • Par-Foam, Inc., Detroit, Mich. • Floral Foam Products, Midland, Mich. • Edwards Sales Corp., Minneapolis, Minn. • Styro Sales Co., New York City • William Summerhays Sons Corp., Rochester, N.Y. • Structural Foams, Inc., Cleveland, Ohio • G. & W. H. Corson, Inc., Plymouth Meeting, Penn. • The Emerson Co., Houston, Texas • Utah Lumber Co., Salt Lake City, Utah • Wiley-Bayley & Company, Seattle, Wash. • S & S Sales Corp., Milwaukee, Wis. • Durofoam Insulation, Ltd., Kitchener, Ontario, Canada.

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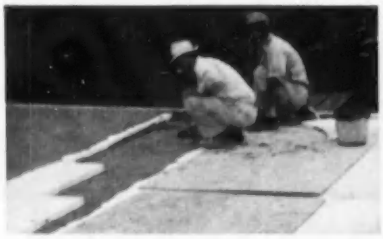
THE BIG BEAR MARKETS IN COLUMBUS, OHIO, USE STYROFOAM INSULATION IN FOUR RECENTLY COMPLETED LOW-TEMPERATURE BUILDINGS

insulation offers unmatched benefits



Rapisardi Orchards, Marlboro, N. Y., need *great strength plus light weight* in the insulation for roof deck of this 36′ x 85′ apple cooler. Low-cost Styrofoam, coated with ¾″ cement finish, provides the answer.

The Lawson Milk Co., Cuyahoga Falls, Ohio, specified *lifetime efficiency, superior resistance to rot, mold, water, moisture.* And experience shows Styrofoam insulation more than satisfies the requirements.

Richardson Farm Dairy, Pontiac, Mich., required *low "K" factor* to maintain its new freezer at —15°F. Mr. Richardson specified Styrofoam—experience had shown it the best low-temperature insulation.

you can depend on DOW PLASTICS

DOW

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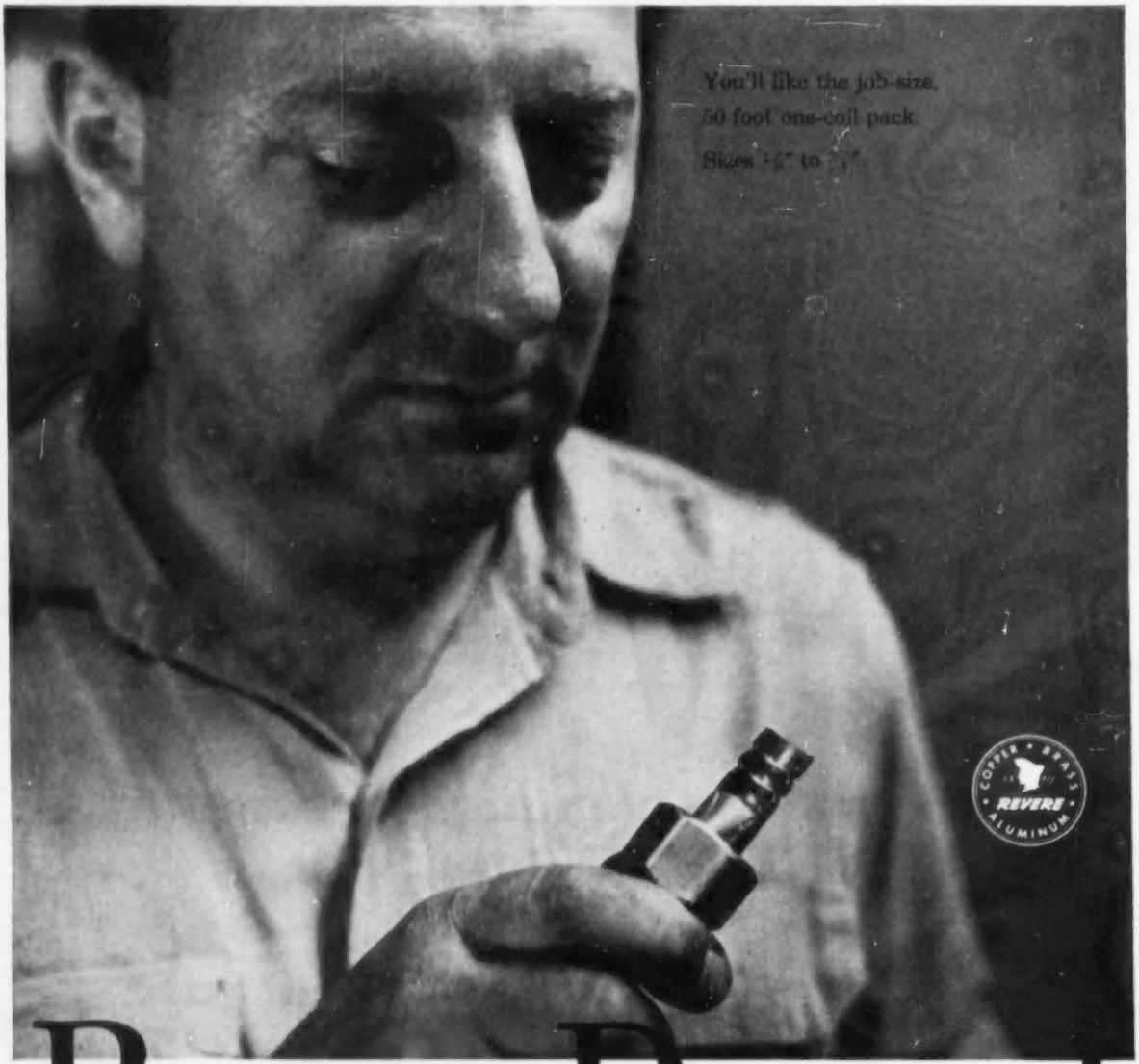

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COPPER REFRIGERATION TUBE

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REVERE COPPER AND BRASS INCORPORATED, *founded in 1801 by Paul Revere*

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BTU'S
TRENDS · OPINIONS · REPORTS

35% OF ALL MEAT CONSUMED will be pre-packaged and frozen within the space of a few short years, according to the considered estimates of food industry spokesmen. At present, the proportion of all meat merchandised in this manner is only about 5%, industry figures show. That difference of 30% between today's reality and tomorrow's potential represents a healthy market for the commercial refrigeration industry.

IMPROVED HUMAN COMFORT from heating, ventilating, and air conditioning is being enhanced by automation techniques borrowed from industry, according to Charles M. Sanders, electronics manager for Minneapolis-Honeywell Regulator Co. Sanders reports that "brain-like" central control systems have been developed and are being used in improving human comfort in more than 50 major new buildings. The systems, called supervisory data centers, are control panels which permit one man to control equipment in all parts of a modern skyscraper. Information is presented graphically and colorfully and means usually are provided for making comfort adjustments throughout the building from central location. For more complete details of such installations, turn to page 71.

BEST BUSINESS YEAR ever is seen for 1957, although inflation will account for much of the rise in dollar indicators of business activity. That is the collective opinion of 221 of the nation's leading economists polled by F. W. Dodge Corp. Buying and selling of commercial refrigeration and air conditioning equipment, already attaining record-breaking levels, should continue on the upturn. The economists expect personal incomes, prices and wage rates to rise moderately in 1957.

QUICK-COOLED PEACHES achieved by bathing the fruit in an ice-bath machine are enabling commercial orchardists to get from eight to 10 days of extra consumer life, according to *Farm Journal* magazine. The magazine reported that buyers like to see the "cooled" stamp; truckers buy them because there's not nearly the load on the truck compressor when the peaches go in cold; and commission men like them because they will hold an extra two weeks if necessary to get the right price. The portable type of ice machine can be hauled from orchard to orchard and handle about 100 bushels an hour. Stationary coolers, usually of the coil-and-compressor type with refrigerated coils instead of ice, take a 100-hp motor to keep compressed refrigerator gas flowing through 2,500 feet of coils. These coolers cost as high as $50,000. Sweet corn also has been fast-cooled. One grower reported that he had held corn in his cold box for 16 days and it still came out sweet and tender.

A "MASTER PLAN" for the air conditioning of big buildings, which would allow air conditioning to be accomplished on a regulated, step-by-step basis, will come into increasing use by building owners and managers, believes W. G. Wassmandorf of The Trane Co. Up to now, many tenants and owners often undertake their own individual air conditioning installations in existing buildings. Result has been a hodge-podge of systems, overloading of sewers and water mains, abuse of electrical systems . . . and a generally messed-up situation. Use of a "master plan", even if the air conditioning program isn't going to begin for two or three years, will avoid these past abuses, and result in a system as well engineered for satisfaction and economy as if it had been undertaken at one time, Wassmandorf says. This plan requires the services of an experienced engineer, who can decide on the type of system to be used, the cost estimation, proper methods of supervising the installation, and where and when to seek competitive bids.

What every Refrigeration Contractor should know about

Refrigeration Piping

by John P. Johnston
John P. Johnston & Assoc., Consulting Engineers, El Segundo, Calif.

MODERN high speed compressors equipped with automatic capacity control have created new requirements in the design of refrigeration cycles.

This discussion will be limited to the application of refrigeration cycles to air conditioning systems in which the range of suction temperatures is from 35° to 55° F. This classification will cover the majority of refrigeration systems and will not include low temperature systems in which special consideration of refrigerant piping and accessories is necessary.

It is obvious that a system operating at full capacity at all times presents no problem in the selection of pipe sizes. In such a system, the prime consideration can be that of capacity loss due to pressure drop through the piping, while still maintaining adequate velocity in the suction and hot gas piping to carry compressor lubricating oil through the system.

To clarify one point before continuing, years ago compressors passed oil in much greater quantities than the present day compressors. The fact of small quantities of oil entrained in the hot gas and passing into the refrigeration system is not in itself detrimental to the operation of the refrigeration cycle so long as the oil passes through the system and is not trapped and/or prevented from returning to the compressor. In view of the small quantity in circulation at any time the effect upon heat transfer factors may be neglected.

With automatic capacity control, it is mandatory that careful consideration be given to suction and hot gas velocities, even at the expense of capacity loss due to pressure drop in some portions of the system. It is conceivable in marginal cases that larger equipment may be required to maintain proper balance because of such losses and in such cases proper design procedure allows no other choice.

It is well established that suction and discharge riser gas velocities of less than 1500 feet per minute will not cause movement of the compressor lubricating oil through the refrigeration system. In horizontal piping these velocities may be reduced to 600 feet per minute.

These requirements lead to the conclusion that some method must be provided to vary the capacity of the vertical risers of suction and hot gas piping, since it is not possible for the same size riser to be proper

for both full capacity and also for capacity perhaps as low as 20% of maximum, dependent upon the compressor cylinder unloading sequence employed.

Fortunately, somewhere along the way, the method of double riser piping was conceived. In this method, Figure 1, one riser is installed of proper size to accommodate the minimum capacity at a velocity of not less than 1500 feet per minute, and a second riser is installed sized so that the sum of the two risers will handle the maximum capacity at the minimum recommended velocity.

The minimum riser is connected directly to the outlet pipe while the secondary riser is trapped. This trap must be as small as possible to reduce the amount of oil stored. Usually the trap is formed through the use of two street elbows arranged as shown in Figure 1.

When the system is operating at minimum capacity, oil is stored in the trap and blocks the flow of gas through the secondary riser. As the capacity of the system exceeds the capacity of the minimum riser, gas is forced through the trap and finally, when full piping capacity is reached, completely cleans the trap of oil which is carried back to the compressor. This method may be applied to either the suction or hot gas piping and should be used at every riser.

Charts for sizing refrigerant piping for Freon-12 are quite common. However, charts for Freon-22 are not readily available, the present technique being the application of factors to Freon-12 charts. In view of this, charts are presented here for use with both Freon-12 and Freon-22 in determining the size of piping for suction, hot gas and liquid lines.

These charts are based upon the application of the following basic data and equations to Type K hard drawn copper tubing under the standard conditions of 40° F suction temperature and 105° F condensing temperature. In these charts, resulting gas velocities are also plotted on the basis of no superheat. In the case of suction gas, the superheat has a negligible

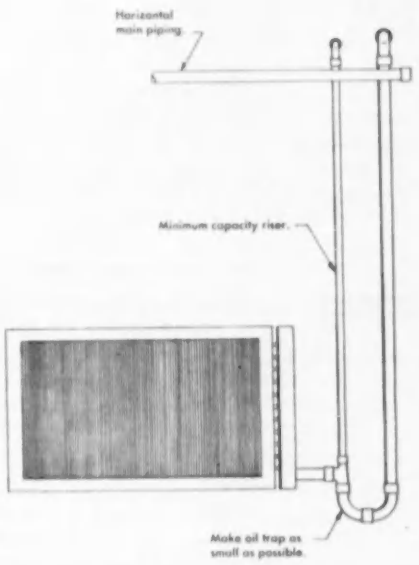


FIGURE 1 — Schematic diagram of piping arrangement for dual suction or hot gas risers.

TABLE 1 — **Refrigerant Circulated at Standard Conditions by Weight**

(Eq. 1) $\text{lb./min./ton} = \frac{\text{ton/min.}}{Hv40 - Hl\ 105}$

where Hv = Heat of Vapor
Hl = Heat of Liquid

For Freon-12 $3.975\ \text{lb/min/ton} = \frac{200}{82.71 - 32.40}$

For Freon-22 $3.010\ \text{lb/min/ton} = \frac{200}{109.09 - 42.65}$

TABLE 2 — **Specific Volume at Standard Conditions**

Freon-12	Suction	0.792 cu.ft./lb
	Hot Gas	0.298
	Liquid	0.0128
Freon-22	Suction	0.656
	Hot Gas	0.234
	Liquid	0.0142

TABLE 3 — **Refrigerant Circulated at Standard Conditions by Volume**

Freon-12	Suction	3.148 cu.ft./min./ton
	Hot Gas	1.185
	Liquid	0.051
Freon-22	Suction	1.974
	Hot Gas	0.703
	Liquid	0.043

TABLE 4 — **Viscosity of Refrigerant at Standard Conditions**

Freon-12	Suction	0.0119 centipoises
	Hot Gas	0.0130
	Liquid	0.240
Freon-22	Suction	0.0122
	Hot Gas	0.0134
	Liquid	0.220

effect, and in the case of hot gas the presence of 35° of superheat would increase the velocities approximately 10%, which would cause the selections of pipe size to be conservative.

TABLE 5 **Bore Area and m Factor for Type K Copper Tubing**

Size	Area - sq. ft.	m Factor
½	0.0008814	0.00837
⅝	0.001515	0.01097
¾	0.002319	0.01358
⅞	0.003027	0.01553
1⅛	0.005400	0.02073
1⅜	0.008454	0.02595
1⅝	0.01196	0.03085
2⅛	0.02093	0.04083
2⅝	0.03234	0.05073
3⅛	0.04609	0.06058
3⅝	0.06249	0.07053
4⅛	0.08114	0.08035
5⅛	0.1259	0.1001
6⅛	0.1798	0.1196

To determine piping velocity in feet per minute simply involves the solution of

$$\textbf{(Eq. 2)} \quad \text{ft./min.} = \frac{\text{cu.ft./min.}}{\text{sq.ft.}}$$

wherein values for area are taken from Table 5 and those for volume in terms of tons are taken from Table 3.

The evaluation of pressure drop is defined by a standard equation of the following form

$$\textbf{(Eq. 3)} \quad V\,(P1 - P2) = \frac{f\,l\,V^2}{8\,m\,g}\left(\frac{W}{A}\right)^2$$

$$\textbf{(Eq. 4)} \quad \text{or} \quad dP = \frac{f\,l\,V}{8\,m\,g}\left(\frac{W}{A}\right)^2$$

where dP - Pressure Drop - lb./sq./ft./
f - Friction Factor - dimensionless
l - Equivalent Piping Length - ft.
V - Specific Volume - cu.ft./lb.
m - Hydraulic Diameter - ft.
g - Gravitational Constant - 32.2 ft./sec.²
W - Flow Rate - lb./sec.
A - Flow Area - sq.ft.

The solution of this equation is somewhat complicated by the fact that the friction factor varies with the Reynolds Number which in turn with other factors vary with the conditions of the refrigerant. The latter variables are readily determined by reference to tabulated data of the thermal properties of Freon-12 and Freon-22. The friction factor was taken to be equal to

$$\textbf{(Eq. 5)} \quad f = \frac{0.21}{Re.^2}$$

Charts for sizing pipe in refrigeration systems are normally given in terms of tons versus pressure drop expressed as a 2° F temperature loss for a length of piping expanded to include fittings and accessories. Figures 2 through 7 show charts presented in the normal manner except that pressure drop is given in terms of lb./sq. in./100 ft. of the equivalent length of the system.

TABLE 6 **Equivalent Lengths of Fittings and Accessories**

Tubing Outside Dia.	½	⅝	¾	⅞	1⅛	1⅜	1⅝	2⅛	2⅝	3⅛	3⅝	4⅛	5⅛	6⅛
Globe Valve Open	14	16	19	22	28	36	42	57	69	83	99	118	138	168
Angle Valve Open	7	9	11	12	15	18	21	28	34	42	49	57	70	83
90° Elbow	1	2	2	2	3	4	4	5	7	8	10	12	14	16
45° Elbow	1	1	1	1	2	2	2	2	3	4	5	6	7	8
Tee	3	4	5	5	6	8	9	12	14	17	20	22	28	34

TABLE 7

Freon-12	Suction	1.8 lb./sq./in./
	Hot Gas & Liquid	3.8
Freon-22	Suction	3.0
	Hot Gas & Liquid	6.1

TABLE 8 — Correction Factors — Freon-12 — Suction

	30	35	40	45	50
95	1.15	1.05	0.95	0.87	0.79
100	1.18	1.07	0.98	0.89	0.81
105	1.21	1.10	1.00	0.91	0.83
110	1.24	1.13	1.03	0.94	0.85
115	1.28	1.16	1.05	0.96	0.87

TABLE 9 — Correction Factors — Freon-12 — Hot Gas & Liquid

	30	35	40	45	50
95	1.12	1.11	1.10	1.09	1.08
100	1.07	1.06	1.04	1.03	1.02
105	1.02	1.01	1.00	0.99	0.98
110	0.98	0.96	0.95	0.94	0.92
115	0.93	0.92	0.91	0.90	0.89

TABLE 10 — Correction Factor — Freon-22 — Suction

	30	35	40	45	50
95	1.15	1.05	0.95	0.87	0.76
100	1.18	1.07	0.98	0.89	0.78
105	1.21	1.10	1.00	0.92	0.80
110	1.24	1.13	1.03	0.94	0.82
115	1.28	1.16	1.05	0.96	0.85

TABLE 11 — Correction Factor — Freon-22 — Hot Gas & Liquid

	30	35	40	45	50
95	1.12	1.12	1.11	1.10	1.09
100	1.07	1.06	1.05	1.04	1.04
105	1.01	1.01	1.00	0.99	0.99
110	0.97	0.96	0.95	0.95	0.94
115	0.92	0.92	0.91	0.90	0.90

In the application of these charts, the equivalent length of the system should be determined in consideration of the actual length of the pipe to which the value of all fittings and accessories are added in terms of equivalent length to provide an equivalent length of the system. Equivalent lengths of fittings are given in Table 6. The amount of pressure drop desired is then determined by capacity considerations and divided by the equivalent length of the system to find the pressure drop per 100 feet.

Normally, past practice has been to allow a drop equivalent to 2° F. Except for risers, which should be sized to provide proper velocity as previously explained, this would be satisfactory for all portions of the system. The 2° F equivalents for Freon-12 and Freon-22 at the standard conditions of 40° F. and 105° F are shown in Table 7.

If by chance the system is to operate at the standard conditions of 40° F and 105° F, then the tonnage value may be used directly without correction. In the event that either the suction or hot gas or both vary from the standard conditions, then the values of tonnage should be corrected through multiplication by the factors shown in Tables 8 through 11 and those values of corrected tonnage used.

Knowing the values of tonnage as corrected from the tables, and the pressure drop per 100 feet desired, the size of pipe and the velocity within the pipe may be determined through the application of these values to the charts shown in Figures 2 through 7 inclusive.

Liquid piping requires no special consideration with respect to minimum velocity and should be sized as a result of pressure drop evaluation. In general, liquid lines should be sized conservatively to avoid high pressure drops resulting in the formation of flash gas and loss of refrigeration capacity.

Flash gas in liquid lines results in a loss in system capacity at the thermal expansion valve due to the displacement of liquid by the gas. Flash gas can be caused not only by friction losses in the piping but also by loss of head due to a vertical lift or by the addition of heat from some external source.

Assume a loss of 2° F in the liquid line where the liquid is saturated at 105° F. In such case, enough liquid will flash into gas to cause the body of liquid to be cooled from 105° F to 103° F. If the liquid had been sub-cooled to 103° F, then the 2° F rise due to friction would have heated the liquid to 105° F, the saturated condition, and no flash gas would have been formed.

Flashing to provide cooling in the order of 2° F is normal, and of such minor magnitude as to normally cause no operational difficulties. However, cooling in greater amounts required to maintain a saturated condition will certainly result in flashing at the expansion valve to a point where the system efficiency will be impaired.

The obvious diagnosis to the service technician will be that the system is short of refrigerant. However, before adding refrigerant (which will not correct the

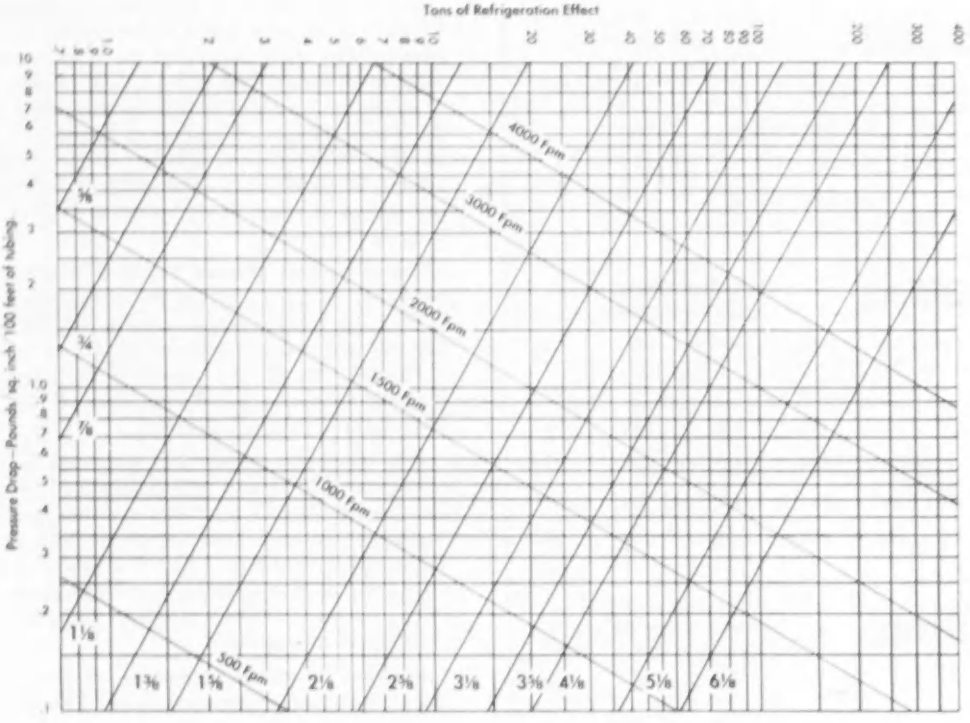


FIGURE 2 — Freon-12 suction gas pressure drop in Type K copper tubing.

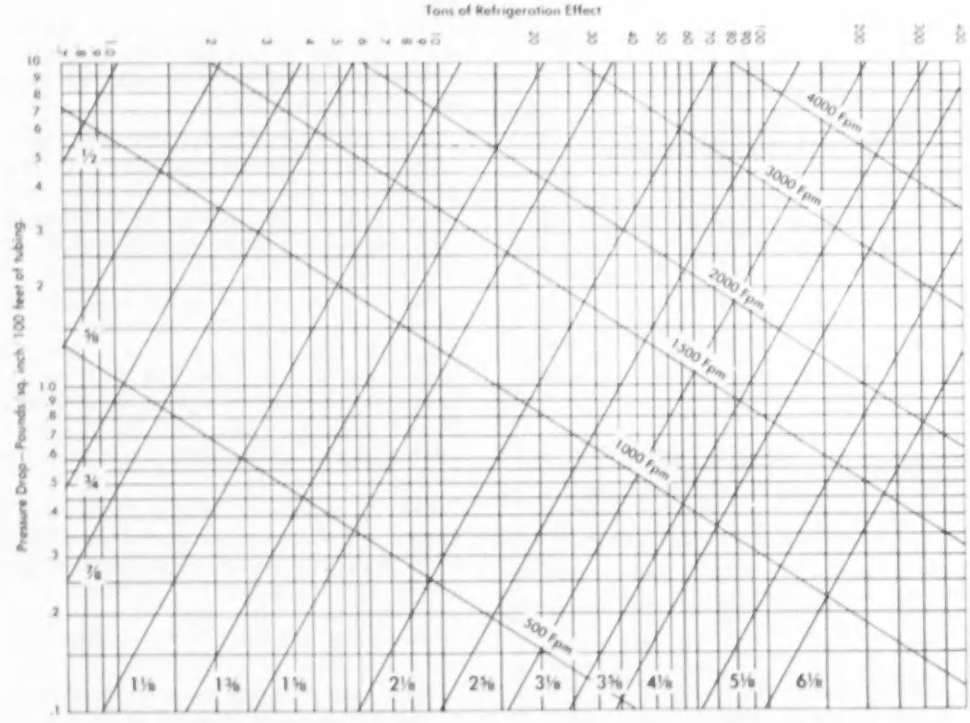


FIGURE 3 — Freon-12 hot gas pressure drop in Type K copper tubing.

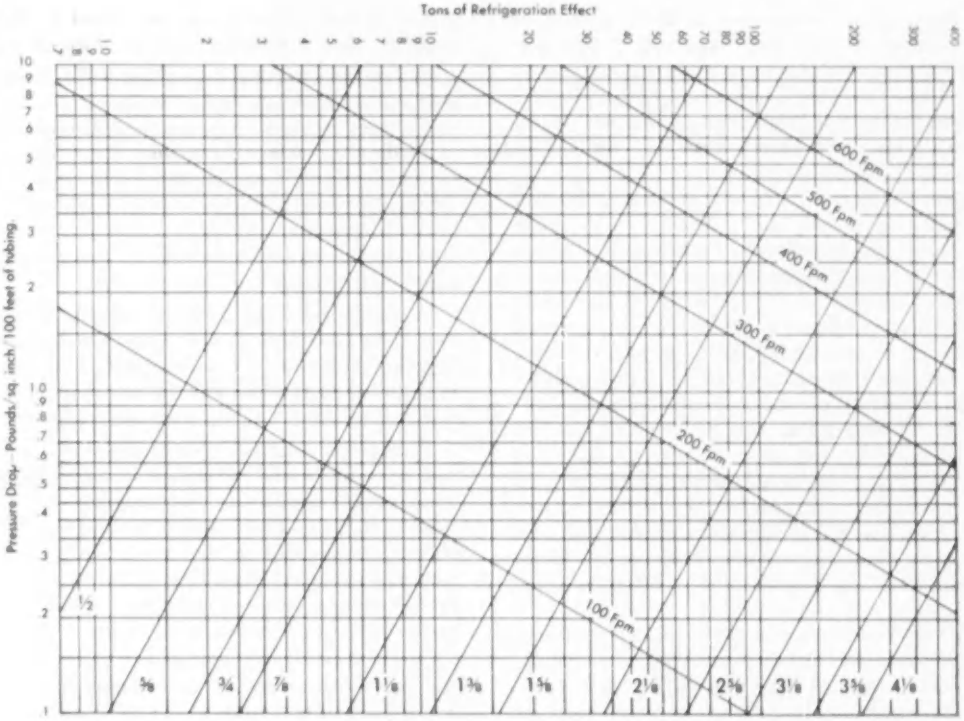


FIGURE 4 — Freon-12 liquid pressure drop in Type K copper tubing.

trouble if the reason for the trouble is due to excessive pressure drop in the liquid line) the service technician will do well to analyze the liquid piping to determine if the piping as installed is of proper size.

Are there numerous accessories in the piping which cause unusual pressure drops? Is the liquid line and, in this instance, the liquid receiver located in the sun or such location where it will gain heat? Does the liquid line have an unusual lift not offset by a drop of approximate corresponding height?

If the answers to the questions asked are favorable, then it is quite probable that the addition of refrigerant will eliminate flash gas at the expansion valve and cause the system to operate properly. In the event that the answer to any of the questions indicates excessive pressure drop or addition of heat to the liquid, then the answer to the problem is the elimination of the factor causing the pressure drop or addition of heat, or the installation of a sub-cooler.

In the case of the addition of heat to the liquid, the same amount of heat must be removed as is added to hold the liquid at saturation without the formation of flash gas. Excessive pressure drop due to friction or lift may be converted into degrees of cooling required by the method shown in the example. Assume a Freon-22 liquid line in which the pressure drop due to friction is 10 psi and that due to lift is 10 psi causing a total pressure drop of 20 psi when operating at a saturation temperature of 105° F.

Saturated liquid at 105° F	212.95 psi gage
Pressure loss	20.00
	192.95

192.95 psi gage corresponds to 98.15° F saturated liquid temperature and the amount of sub-cooling required to prevent flash gas is 105 - 98.15 = 6.85° F.

This sub-cooling may not be accomplished by a suction-liquid heat exchanger at the top of the lift because the liquid will flash on the way to the exchanger and the resultant flash gas will cause the exchanger to operate at low efficiency. Such a device may be used at the bottom of the lift if the proper amount of liquid sub-cooling may be obtained from such an interchanger, or sub-cooling may be provided by installation of sub-cooling coils in the condenser or by any other suitable means.

The suction-liquid heat exchanger is advocated mainly by manufacturers of compressor equipment who are fearful of the effect of liquid entering the compressor crankcase. They rely upon the device as insurance against improper piping and adjustment of thermal expansion valves. However, the effect of superheating suction gas produces equally bad results in creating an even higher degree of superheat in the discharge gas from the compressor.

How many installations exist today where the paint

on the head of the compressor is badly burned or peeling from operation at high superheat. Proper piping and adjustment of system components can prevent "wet gas" and "slugging", and leaves little to be said for the use of suction-liquid heat exchangers in air conditioning systems where the only reason for its use is to superheat the suction gas.

To return briefly to the subject of oil passage through the refrigeration system and its return to the compressor, again remember that this discussion relates only to air conditioning applications wherein suction temperatures range from 35° F to 55° F and where automatic capacity control is applied to the compressor.

Oil separators have been used to prevent oil from getting into the refrigeration system, but depending upon the efficiency of the individual design some amount of oil still leaves the compressor. The important question is whether or not this oil will pass through the system and return to the compressor, or whether it will become trapped in the system. As previously stated, modern compressors do not pass any more than a minimum amount of oil, probably no more than would be passed by the average oil separator.

The oil separator as a manufactured and cataloged item is designed for certain volumetric and thermal capacity with due consideration given to velocity through the separator. If the separator is selected on a basis of maximum capacity, as it must be, then what happens when it operates at 20% of rated capacity?

At low velocity, the design factors no longer hold true and condensation will take place in the separator, particularly in a cold equipment room where the room ambient is less than the surface temperature of the separator. Under this condition, quantities of liquid refrigerant along with the separated oil are returned to the compressor crankcase, creating the very situation that the manufacturers of the compressor equipment warn against.

Naturally, since the liquid is released through the float valve from high to low pressure it boils, causing foaming of the oil. The usual result of this condition is a loss of oil pressure and operation of the oil pressure safety switch to shut down the equipment.

To the credit of the companies who manufacture heat exchangers and oil separators, such devices do, under proper conditions, have application to the refrigeration cycle. However, many designers of refrigeration systems who do not fully understand the factors involved have allowed themselves to be influenced by over-zealous salesmen into specifying these devices on the basis that they can do no harm.

Proper design of the refrigerant piping and intelligent application of the various components will result in trouble-free operation of the refrigeration cycle.

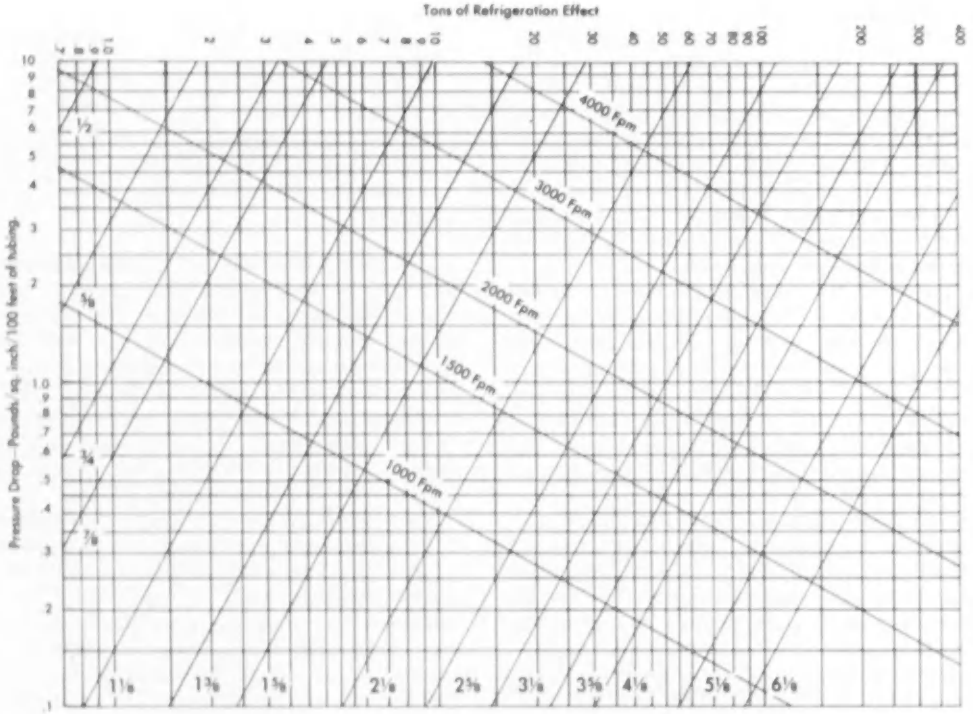


FIGURE 5 — Freon-22 suction gas pressure drop in Type K copper tubing.

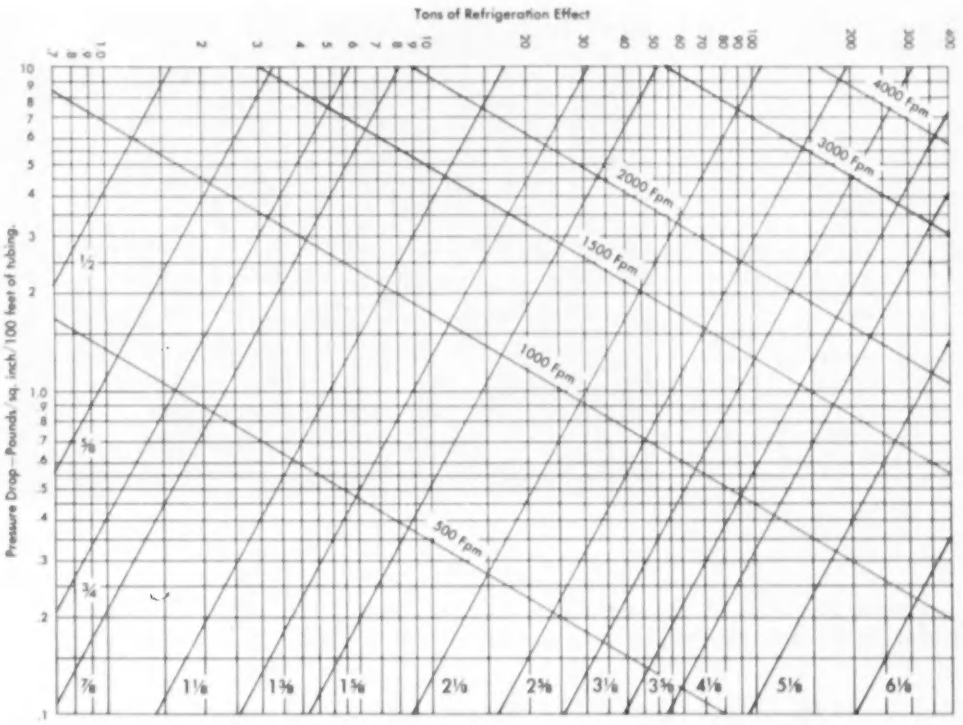


FIGURE 6 — Freon-22 hot gas pressure drop in Type K copper tubing.

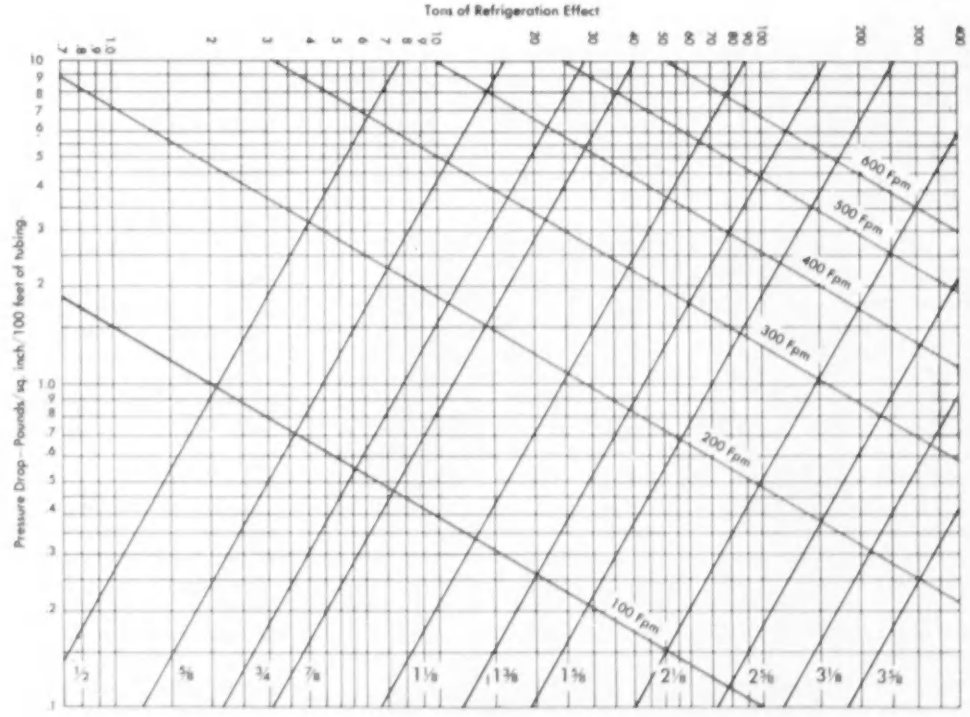


FIGURE 7 — Freon-22 liquid pressure drop in Type K copper tubing.

KEYNOTE of florist coolers is the individuality of design demanded by the merchants. That's why this refrigeration dealer believes in letting them build their own, while he supplies the cooling equipment.

This dealer finds he can make money on

"Do It Yourself" Florist Boxes

TALK to a dozen different florists about the type of refrigerated display case they want, and you'll get a dozen different ideas. At least, that has been the experience of S. E. Abbott, head of Boulder Refrigeration Co., Boulder, Colo.

"Almost all florists have very sharply defined ideas on this subject," Abbott points out, "and that's why it is so difficult to satisfy them with factory-built boxes. These production line models simply don't have the distinctive touches of individuality which most florists demand.

"Extreme price consciousness," declares Abbott, "also seems to be almost universal among florists, and this often deters them from contracting with a commercial refrigeration firm such as ours for construction of the inevitably more costly custom-built display and storage facilities for their flowers which their particular needs may require."

Recognizing these facts, and revamping his own merchandising techniques accordingly, Abbott has developed a highly specialized sales approach for florists which has won for his firm a substantial volume of profitable business in this field.

Sales Approach Outlined

Basically this sales approach consists of a "do it yourself" pitch, insofar as the erection of the storage cooler is concerned. Whenever Abbott finds a florist who wants a display refrigerator of unusual size or shape, or one constructed of some type of special material, he simply suggests that the florist contract for construction of the case with a local carpenter or cabinet maker, allowing Abbott's firm to equip the completed fixture with a refrigeration system of the proper size and type.

This proposal appeals to most florists, who seem to feel that they can effect substantial savings in this manner. "Actually," Abbott admits, "unless the florist is the handy type who can build his own case, the cost is apt to be approximately the same as if we did it for him, or maybe in some cases even higher. But handling the deal this way we encounter less sales resistance.

"The customer doesn't blame us for the high cost, and we still get the part of the installation in which we are really interested. Thus a sale which otherwise might have been delayed for some time, or even lost entirely, is consummated."

A typical example of this technique in action was the sale made by the Abbott organization to the brand new Lindon Florist Shop recently opened in the Base Mar shopping center near Boulder. Here the florist wanted a big, showy display refrigerator which would have cost $3000 or more if a "ready-made" fixture had been ordered.

When the prospect balked at this price, Abbott noted that the florist himself had turned out several professional-looking display tables, small cases, and similar shop appointments. Result? Abbott suggested to the florist that he build his own display case and allow Boulder Refrigeration Co. to provide it with an adequate refrigeration system.

Florist Builds Cooler

The florist enthusiastically accepted this proposal and within a few weeks had erected an 8 x 8 x 6′ cooler covered with simulated walnut paneling trimmed in bright green hardwood stripping. Three panes of "Thermopane" glass, each 4′ high, were installed in the front wall of this cooler, with the center panel sliding on a track rail to provide easy access to the display area.

Abbott made it a point to visit this job regularly during the construction of the cooler, and made whatever suggestions he thought might help the florist to achieve the results he desired. For instance, he suggested installation of a peg board divider across the center of the case, from one side to the other, which would permit display of flowers in front of the partition and storage behind, while allowing ample circulation of air both above and below the divider as well as through the holes in the peg board itself.

Dealer Installs Equipment

At the proper stage of construction, the Abbott organization moved in to install a ¾-hp compressor and a 6600-cfm ceiling-mounted blower coil to handle the refrigeration requirements of the custom-built fixture.

In this instance, Abbott reports, the florist actually was able to save several hundred dollars on the installation by constructing the case himself, all of which pleased him very much. Abbott, too, was happy, for his organization was able to realize a normal profit on the sale and installation of the refrigeration equipment, without all of the headaches of building a tailor-made fixture.

Ice Rink Promotes Home Cooling

FREEZING an ice skating rink in the near-100-degree temperatures of a sun-baked desert town by using a standard 5-hp home air conditioner as the power plant might seem like the wildest flight of fancy — but that's exactly what was accomplished by Bob Perrine, Carrier dealer in Yuma, Ariz.

Perrine decided to install this unique skating rink in his company's booth at the Yuma County State Fair as a means of dramatizing to the public the cooling qualities of the "Weathermaker" residential air conditioning line which he handles.

Equipping a regular 5-hp air cooled model with special controls and hooking it up to a sufficient amount of tubing to form the rink floor, Perrine's crew froze a 3″ layer of ice over the 10 x 18′ area of the booth. To add a professional touch, colored lights equipped with "winkers" were placed in large jars and frozen under the ice.

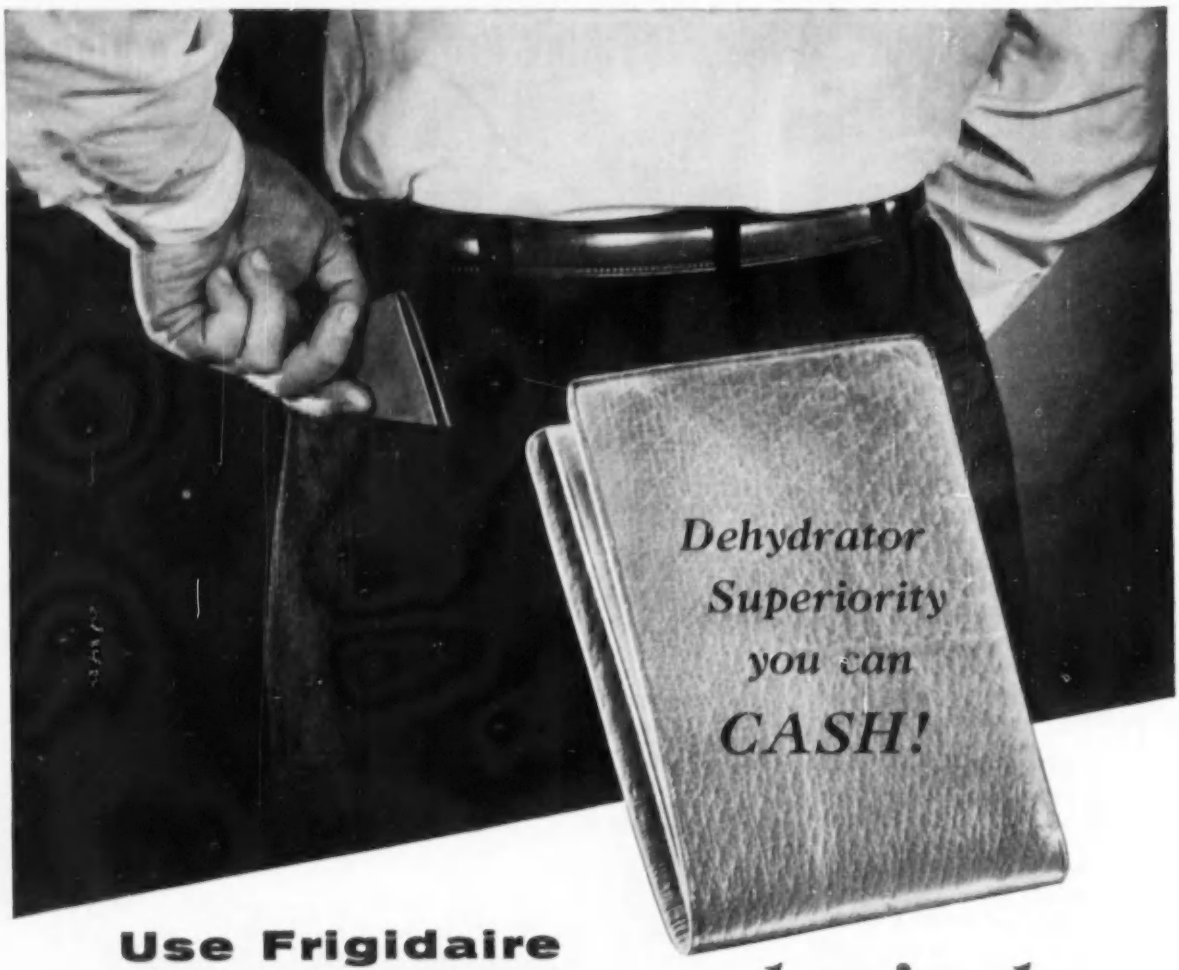
In building his novel skating pond, Perrine was forced to solve a number of formidable problems. First he framed the rink area with 4 x 4 lumber. Then he formed a shallow waterproof tank by covering the bottom and sides of the framed area with building paper, sealing the edges carefully to prevent leaks.

A special grid of copper piping had to be made up in three sections at his shop, and then assembled on the rink floor. After the cooling coils were set in place, they were connected to the air conditioning unit.

Freezing time for 240 gallons of water took 20 hours in the 95 F heat. The rink's location in one corner of the Fair's "big top" circus tent afforded little wind protection but good shading. To maintain the rink surface in good condition, hot water was poured over the ice each night to melt down rough spots and make the surface freeze harder and cleaner. Freezing time was speeded by laying a cardboard cover over the ice.

Debut of the ring, believed to be the first ever constructed in this section of the country, sent goggle-eyed natives scurrying on a search for ice skates. Three local radio stations broadcast calls to aid in this hunt, and soon Yuma's only skating pond was crowded with eager youngsters gingerly testing the first ice rink they'd ever seen.

STAR attraction of the Yuma County Fair was the 10 x 18′ skating rink maintained in the booth operated by Bob Perrine, local air conditioning dealer. Here Perrine laces the skates of Marlene Bates, the Fair's queen, as she prepares to give the ice its initial test.



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PARTS AND ACCESSORIES

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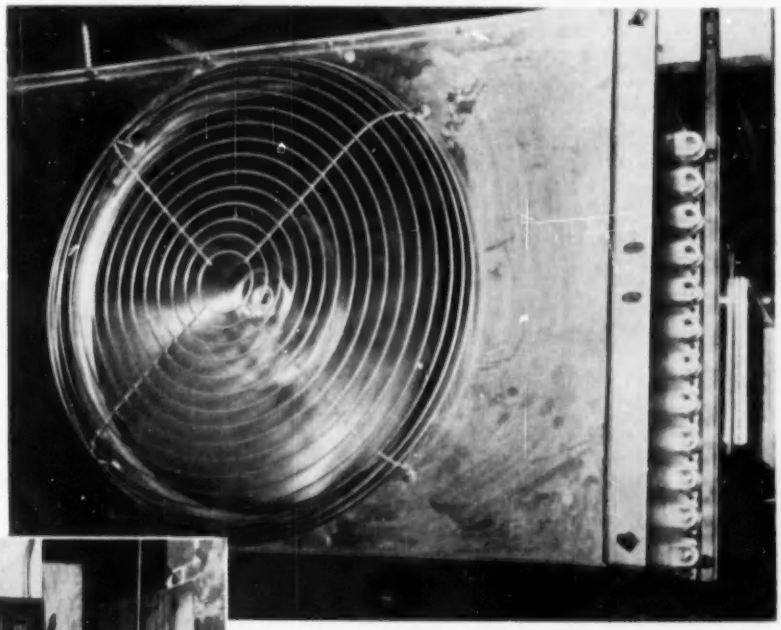
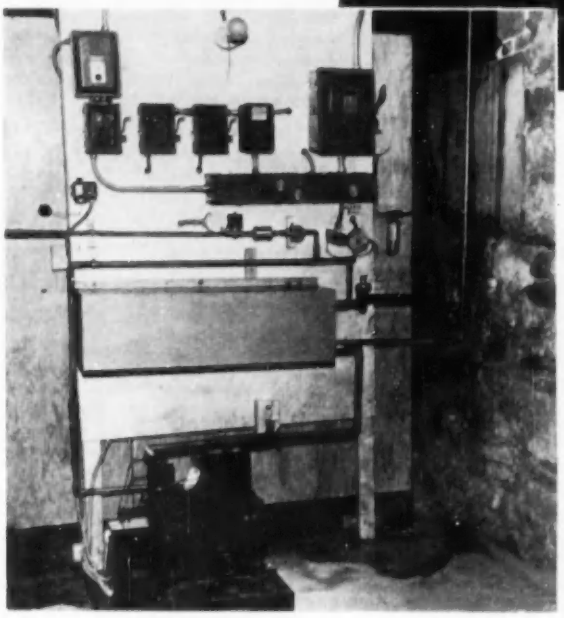


ADDED DUTIES performed by the ceiling-mounted air cooled condenser shown at right include ventilating and heating of the machinery room seen below. In summer, hot air leaving the condenser is discharged to the outside through a duct, thus providing a degree of ventilation. In winter, doors on this duct are opened and the discharge air is recirculated throughout the machinery room to heat it.



3-Way Stretch

Besides doing its regular job, the air-cooled condenser serving this supermarket's freezer room performs a heating and ventilating function, too

AN unusual installation twist is giving Ciotti's 18th Ward Supermarket in Reading, Pa., some "bonus" benefits from the low-temperature refrigeration equipment it recently put in service in its frozen food storage room. The system is arranged so that the air-cooled condenser serving the storage room ventilates the machine room in summer and heats it during the winter.

In the Ciotti installation, the air-cooled condenser, a Kramer Trenton Unicon unit designed for either indoor or outdoor installation, is ceiling-mounted inside the building, and is connected to an air duct discharging outdoors. The air duct has adjustable openings on the side so that the warm air from the condenser can be recirculated through the building during the winter. In the summer, the hot air leaving the condenser is ducted outdoors.

The supplementary heating system was designed by Samuel B. Anewalt, owner of the Reading Air Conditioning Co. While this particular feature undoubtedly influenced the supermarket's final decision, it was not the principal reason for selecting air-cooled equipment. Two other problems—a troublesome shortage of water during the peak of the summer months, and the lack of adequate sewer facilities—were the factors that tipped the scale in the choice of equipment.

Temperatures in the storage room, which measures 12′ x 20′ and is 8′ high, are maintained at –10 F. Cooling and defrosting are done by a Kramer "L" Thermobank automatic hot gas defrost system.

Here's How

PROFITABLE SERVICE AND INSTALLATION PRACTICES

I DO IT THIS WAY

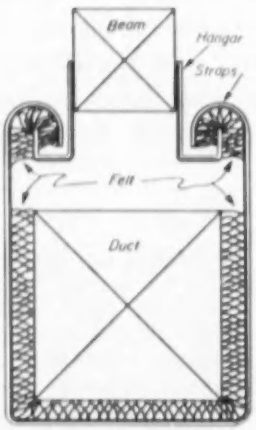
WHEN dismantling pipe lines, sometimes the threads are so hard to unscrew that the pipe will flatten before the thread will let go. Almost any pipe can be unscrewed by lining up two, three, or even more pipe wrenches, with a man on each wrench, and all pulling at once.

M. S. Chapman
Wheeling, W. Va.

"Floating" Ductwork Helps Deaden Sound

Ever run into an air conditioning job where maximum sound control is essential? If so, you might borrow a leaf from the notebook of one large New York contractor who recently was called upon to provide cooling for a recording studio.

Obviously, in such an application, noise and vibration resulting from equipment and air movement had to be held to the lowest possible level so as not to interfere



with the quality of the recordings. Consequently, in addition to all the normal sound deadening devices such as canvas connectors, vibration mountings for cooling units, and acoustical duct lining, this contractor employed a novel method of suspending the ductwork so that it virtually "floated" in air, with so solid connection between it and any structural part of the building.

This was accomplished, as indicated in the accompanying sketch, by hanging the duct from ceiling beams by means of specially constructed straps carefully calculated to eliminate all vibration. As suspended in these straps, the duct itself is actually cradled in felt. Another layer of felt serves to provide vibration isolation at the point where the upper and lower segments of the straps come into contact with each other.

How To Locate Troubles In Air Compressors

An air compressor of one kind or another is an essential piece of equipment in every well-equipped refrigeration or air conditioning service shop. But just like refrigeration compressors, air compressors too can get out of order. And sometimes the source of the trouble is mighty hard to find.

To help servicemen in properly maintaining this important item of their shop equipment, Worthington Corp., which makes air compressors as well as compressors for refrigeration and air conditioning use, offers the following practical pointers on servicing *water-cooled* air compressors:

TROUBLE: Failure to deliver air.
LOOK FOR: Suction line blocked—dirty filter; valves improperly installed; suction valve unloaders stuck in unloaded position; strips missing from valves.

TROUBLE: Insufficient pressure.
LOOK FOR: Demand greater than rated capacity of unit; speed incorrect; worn rings; packing leaking; excessive leakage in system and internally.

TROUBLE: Compressor vibrates.
LOOK FOR: Not properly secured to foundation; improper foundation; piping not supported properly.

TROUBLE: Insufficient capacity.
LOOK FOR: Excessive leakage in pipelines and fittings and through valves; discharge pressure higher than rating; speed incorrect; filter clogged; worn piston and rings; faulty valves; packing leaking; suction valve unloaders holding strips partially open.

TROUBLE: Compressor overheats.
LOOK FOR: Broken valve strips; cooling water inadequate; filter clogged; discharge pressure higher than rated; internal leakage.

TROUBLE: Compressor overloads motor.
LOOK FOR: Electrical characteristics of power lines incorrect; multi-V-drive belts pulled excessively tight; discharge pressure higher than rated; speed greater than rated; discharge line restricted.

TROUBLE: Compressor knocks.
LOOK FOR: Loose flywheel or pulley; excessive wrist pin and bushing clearance; excessive crank pin bearing clearance; excessive crosshead clearance; main bearings need adjusting; loose valve in cylinder; loose piston nut.

(Tips on servicing air-cooled air compressors were published in the "Here's How" section of last month's issue.)

I DO IT THIS WAY

TWO troublesome complaints frequently stemming from air cooled condensing units are air in the system and dirty condensers. I've found a way of handling both of these problems in the same operation.

I simply connect a 1/4" S.A.E. flexible charging hose to the discharge valve gage connection, close the king valve, and pump down the system. Then I open the valve and direct the purge over the condenser area. In this way I manage to give the condenser a thorough cleaning while I'm ridding the system of any air which might have been in it.

Harry W. Gifford
Merchantville, N. J.

Editor's Note: This suggestion is OK if the system requires purging anyway, but of course it would result in wasting refrigerant if no purging were needed.

TEMPRITE BUYS EVERHOT

Temprite Products Corp., has purchased EverHot Water Heater Co., Detroit manufacturer of home water heaters. This firm will now operate as the EverHot Heater Div. of Temprite.

Circle No. 32 on Reader Service Card →

Versatile New **Ranco 016 Controls** Simplify Commercial Installations

New Pressure and Temperature Controls Feature Higher Electrical Ratings, Range and Differential Adjustability

Your control installations on heavy-duty refrigeration and air conditioning equipment are strictly routine with Ranco's new series 016 Controls.

The eleven versatile Ranco models in the new 016 line—including low pressure, high pressure and temperature types—are built to accommodate the higher electrical ratings of some commercial equipment. All models feature single pole, double throw switches designed to open or close on rise of temperature or pressure. And all can be provided with manual reset feature.

Pressure control ranges vary between 5 and 360 psi with adjustable differentials from 10 to 100 psi. Temperature models feature −30° to 105° ranges, adjustable differentials from 2½° to 27°, or fixed differentials of 2° to 4°.

Electrical ratings are approved and listed by UL and CSA: 115 and 230 a.c. Maximum Motor Amp Ratings: Full Load—15.5; Locked Rotor—60.

For full details on the efficient new 016 Ranco Control to simplify your commercial installation, contact your Ranco Wholesaler today.

Ranco Inc.

COLUMBUS 1, OHIO

Ranco Low Pressure Commercial Refrigeration Control, 016-107

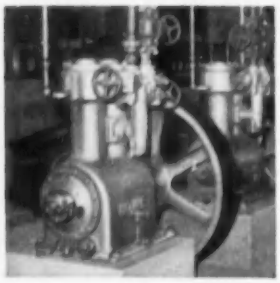
- Contacts open or close on rise of pressure.
- Single pole, double throw switch.
- For SO_2, CH_3Cl, F-12, F-22 and Carrene 7 refrigerants.
- 5 to 95 psi range.
- 10 to 40 psi adjustable differential.
- 10" vac. lowest operating point.
- 115 and 230 V. a.c., 15.5 amps full load, 60 amps locked rotor.

WORLD'S LARGEST MANUFACTURER OF REFRIGERATION CONTROLS

IN REFRIGERATION *it Pays to Know* HOWE

COOL IT

with one or more of Howe's complete line of modern space-saving automatic ammonia compressors. Sizes—2 to 150-ton capacity. Built for maximum service with minimum cost.



FREEZE IT

with Howe Booster Compressors. Food freezing techniques to meet today's rigid requirements. Can be engineered and built to your local plant conditions with equipment manufactured by Howe.

HOLD IT

A complete line of high efficiency unit coolers, polar circle coils, fin type coils — designed to handle any size of storage cooler or storage freezer. For preserving fresh and frozen foods.

WRITE FOR LITERATURE

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HOWE ICE MACHINE CO.

Since 1912, manufacturers of ammonia compressors, condensers, coolers, Rn coils, locker freezing units, air conditioning (cooling) equipment.

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Circle No. 33 on Reader Service Card

USEFUL BULLETINS • BOOKLETS • CATALOGS

FULL-SCALE INDICATION test instrument by Royco Instruments is described in new leaflet identified as Form 2P756. Instrument is illustrated in use with a close-up of the dual Fahrenheit and centigrade scales linearly calibrated from 0 to 650 F. Outline drawing and a list of specifications and features are included.

Circle No. 86 on Reader Service Card

CHECK POINT LIST for ordering pressure gauges is one of many features of Catalog No. 400 available from United States Gauge, Div. of American Machine and Metals, Inc. Eight-page publication deals with the selection of test gauges, also cataloging a variety of units for various applications.

Circle No. 87 on Reader Service Card

DESIGN HIGHLIGHTS of the complete line of Brewer-Titchener Corp., refrigerated cabinets for milk and dairy products are listed and illustrated in eight-page, two-color catalog. Complete specifications of the various models are supplied with information listed on insulation, refrigeration, capacity, over-all size, and general construction.

Circle No. 88 on Reader Service Card

UPRIGHT FREEZER LINE of Nor-Lake, Inc., is described in catalog sheet, Form UF-7. Construction features are illustrated and examined in copy and cutaway drawings, while model numbers, capacities, finishes, and compressor sizes are listed in the specifications.

Circle No. 89 on Reader Service Card

FORM DESCRIPTIVE CATALOG VXB inserts now are available from Tork Clock Co., Inc. Commercial defrosting time switches are covered in No. 356, while typical wiring diagrams of these units are listed in Bulletin No. 563. Explored in Insert No. 155 are light and power time switches. Air conditioning time controls are described in No. 511.

Circle No. 90 on Reader Service Card

TIME-SAVING FEATURES of Model 235S evaporator pressure regulating valve are covered in sales bulletin by A-P Controls Div., Controls Co. of America. Detailed specifications are furnished along with pertinent illustrations.

Circle No. 91 on Reader Service Card

JUST RELEASED is informative brochure which deals with the conditioning of water, steam, and products used in refrigeration and air conditioning. Publication available from Berna Corp.

Circle No. 92 on Reader Service Card

COMPLETE PRICE SCHEDULES for Dean Products, Inc., job-tailored cold plates are included in comprehensive technical data Bulletin No. 563. Illustrations handsomely reproduced in full color show foods displayed on actual cafeteria counters. Helpful drawings are offered for determining capacities.

Circle No. 93 on Reader Service Card

HEAD PRESSURE CONTROL is explained in Refrigeration Engineering, Inc., literature section devoted to hot-dipped galvanized modulating dampers. Designated Catalog No. 30C6a ("Recold Dri-Fan Condenser") for both Freon and ammonia, publication includes extensive selection data. Graphic illustrations point out product's unique characteristics.

Circle No. 94 on Reader Service Card

NEW PRODUCT "PERMAWICK", a lubricating fluid that fills any size sleeve bearing cavity, is described and summarized fully in attractive brochure available from Fluidwick Co. Advantages and development history include actual testing information with a chart illustrating comparative oil retention tests.

Circle No. 95 on Reader Service Card

"TIME IS MONEY" is the title of 20-page booklet by Paragon Electric Co., which is complete reference to multi-purpose and industrial time controls. Provided are the correct answers for countless electrically-operated, automatic, on-off operations used in commercial and industrial applications. Fold-out reference chart clearly defines what each control is, what it does, where it may be used, and how to select and purchase it.

Circle No. 96 on Reader Service Card

ILLUSTRATED V-BELT DRIVE engineering manual by Maurey Mfg. Corp., contains 66 pages geared to provide ready and complete data. Three sections comprise publication: "V-Drive Selection", devoted to drive service factors; "Drive Design Section", including tables of hp ratings; and "General Information Section".

Circle No. 97 on Reader Service Card

DUCTILE IRON PIPE FITTINGS are listed and described in Catalog No. 1 available from Kuhns Brothers Co. Units are illustrated and data is furnished on size, list price, weight, and dimensions.

Circle No. 98 on Reader Service Card

COLD STORAGE DOOR quality is the theme of highly illustrated booklet by Jamison Cold Storage Door Co. Entitled "An Open and Shut Case of Quality", brochure briefly describes the human and mechanical ingredients involved in design and production. Materials, methods, equipment, and skills are discussed, showing in large pictures different door products in key stages of manufacture.

Circle No. 99 on Reader Service Card

USES AND SAFETY FEATURES of "V-Sol" industrial solvent are described in illustrated catalog page by Speco, Inc. Informative publication explains that solvent has cleaning properties closely resembling carbon tetrachloride, but up to 20 times less toxicity.

Circle No. 100 on Reader Service Card

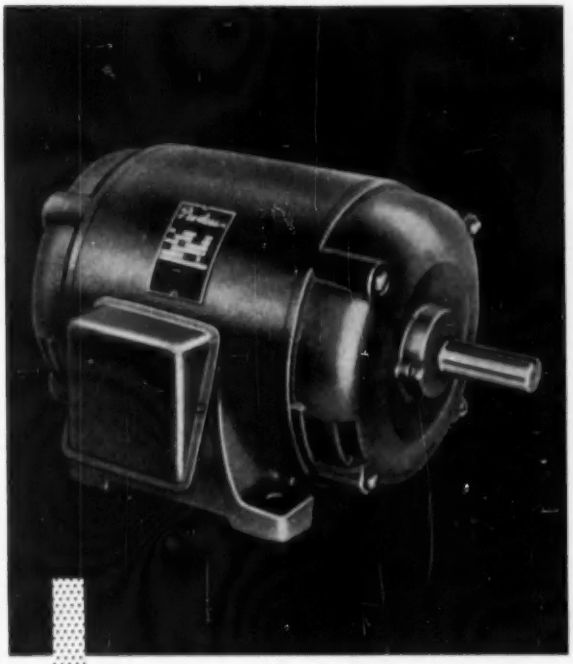
DESIGN CHARACTERISTICS of Silvercraft, Inc., "Summer Shower" cooling towers are examined in two-color brochure. Illustrations show how capacity is enlarged easily by fan blades. Maintenance features are discussed.

Circle No. 101 on Reader Service Card

CONSTRUCTION FEATURES of the "Texrope" grommet V-belt are described in brightly colored Allis-Chalmers Mfg. Co., Bulletin No. 2086497C. Cross-sections of other leading belts are shown while line drawings depict the grommet belt at no load and full load as compared to an ordinary belt under the same conditions.

Circle No. 102 on Reader Service Card

(See page 76 for Air Conditioning Literature)



Newest Accepted Design in Refrigeration Duty Motors

● This trouble-free motor starts and runs refrigeration compressors under the most severe conditions. It has just three parts which wear because of motion or electrical contact — the bearings; contact points on the stationary part of the switch; and the centrifugal parts of the switch. Excellent design holds wear on these parts to a minimum. Servicing is practically eliminated. Motors are Underwriters' approved.

Write for Peerless Refrigeration Motor Bulletin. It shows recommended wire sizes, construction features and answers those questions asked most often by men who service and distribute refrigeration duty motors. It shows you how motor service and maintenance can be held to a minimum.

ELECTRIC MOTOR DIVISION
THE *Peerless-Electric*® COMPANY
FANS · BLOWERS · ELECTRIC MOTORS · ELECTRONIC EQUIPMENT
WARREN, OHIO

Circle No. 34 on Reader Service Card

NEW PRODUCTS

For further information on any of these products, simply circle on the postcard provided in this issue the key numbers of the items in which you are interested. Your request will be forwarded directly to the companies concerned.

(For Air Conditioning Products turn to page 78)

Pipe Joint Compound

Product: "Pipetite-Stik", pipe joint compound for use on plastic and metal threads, on lines carrying water, steam, gas, refrigerants, butane, propane, etc.

Manufacturer: Lake Chemical Co., 3052 W. Carroll Ave., Chicago, Ill.

Features: Maximum temperature rating now boosted to 750 F, pressures to 5000 psi. New package wrap, available in 1 and 3-doz., self-display counter boxes. Does not contain lead, is nontoxic, and has no injurious ingredients of any sort, manufacturer says. Withstands vibration or temperature changes. Will not rust. Permits joints to be opened easily again at any time. Shaped like large crayon, is applied simply by rubbing two or three strikes across male threads.

Circle No. 120 on Reader Service Card

Water Conditioner

Product: Improved type of water conditioning unit.

Manufacturer: Evis Mfg. Co., San Francisco, Calif.

Features: No moving parts to wear out, no electrical connections, no chemicals needed, and nothing else to be added. According to manufacturer: Eliminates old lime-scale and prevents new scale from forming in condensers, cooling towers, spray nozzles, heat exchangers, compressor jackets, and associated piping. Faster elimination of entrained gases and less replacement and maintenance required no valves and

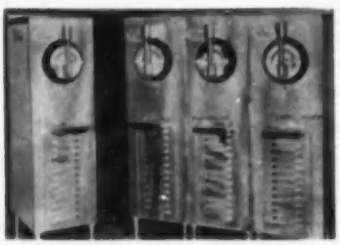
controls. All water-using equipment directly benefits through cleaner working parts, resulting in minimum break-downs and longer life. Constructed as processed metallic pipe attachment of galvanized iron, bronze, or aluminum to accommodate specific requirements. Crystalline quality of attachment provides inductive influence which changes water in its physical behavior with water-born sediments. No operating expense connected with product, as it fastens directly to pipe and is not much larger than the water pipe itself. Requires no floor space.

Circle No. 121 on Reader Service Card

Fountain Equipment

Product: Line of two milk shake making machines and two soft ice cream dispensers.

Manufacturer: Sweden Freezer Mfg. Co., Seattle, Wash.



Features: All units are 52⅝" high and 14¾" wide. Each machine is complete in itself, but can be matched with any of other three into efficient series to give whatever production is desired. Joining kits are available to tie units together in simple operation, with each maintaining its own individual power and water connections. Heavy duty compressors are water-cooled and hermetically sealed. Ready-made power and water connections make installation easy.

Circle No. 122 on Reader Service Card

Chilling Machine

Product: Low-temperature chilling machine (Model SU-120-4) with 4 cu.ft. chamber designed for laboratory testing in regard to quality control and product development uses.

Manufacturer: Cincinnati Sub-Zero Products, Cincinnati, Ohio.

Features: Net thermal capacity of approximately 600 Btuh at –120 F, with temperature selection from –80 F to –120 F, and full-range pull down in 45 minutes. Outside dimensions are 59" high; 25" deep, and

26" wide. Chilling chamber, 18 x 17 x 18". Full access to chamber area is provided by front opening door, which has 12 x 12" multipane frostproof windows. Door's positive triple seal is assured by three gaskets, two of sponge rubber, the third balloon-type. Chrome latch operates with touch of finger. Electrically operated lifetime red light will remain on during normal operation, going off only in event of power failure.

Circle No. 123 on Reader Service Card

"Snap-On" Pipe Strap

Product: Metal "snap-on" strap for pipe, rigid, and thinwall conduit.

Manufacturer: Holub Industries, Inc., Sycamore, Ill.

Features: Permits neater, faster installations because it doesn't have to be held in place. Particularly good for overhead work, or hard-to-reach jobs, since it can't drop off. Further savings can result, manufacturer says, by using these straps and spot welding for installation to steel framework. Bump in strap causes slight springing action which

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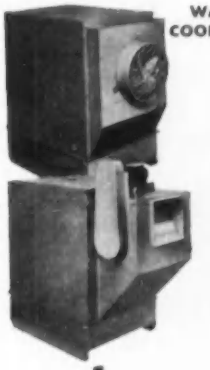
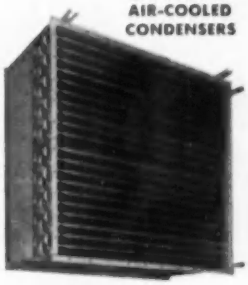
for economy · efficiency · easy servicing

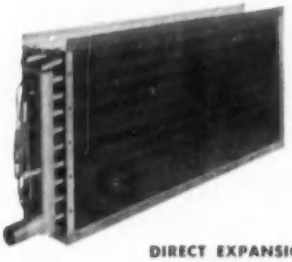


WATER-SAVER COOLING TOWERS

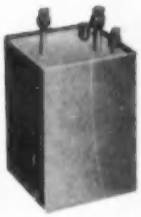


ZEPHYRCON AIR-COOLED CONDENSERS

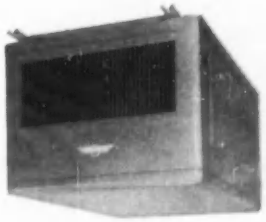
HEAT EXCHANGERS



AIR CONDITIONING COILS



DIRECT EXPANSION WATER COOLERS

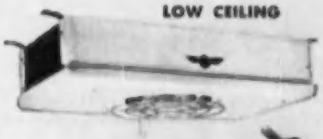


AIR CONDITIONING UNITS

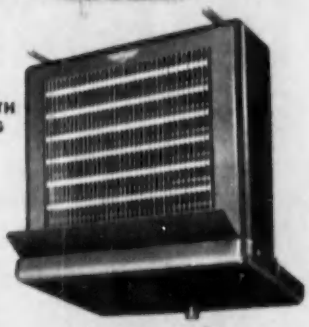
DISPLAY CASE COILS

humi-temp units

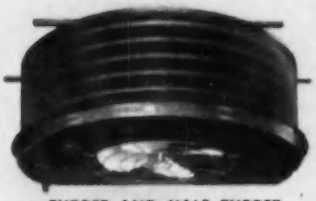
WALL



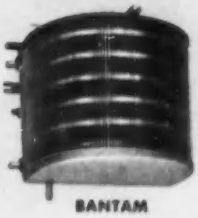
LOW CEILING



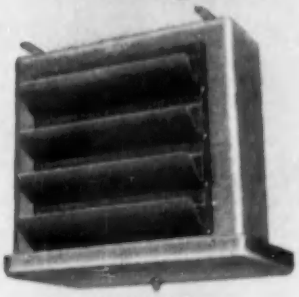
LOW TEMPERATURE WITH HOT GAS DEFROSTING



TURRET AND HALF TURRET



BANTAM



STANDARD

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P.O. Box 1699, ATLANTA 1, GEORGIA

Circle No. 35 on Reader Service Card

holds strap firmly in place. Ribbed construction adds to snap and provides rigid support of conduit or pipe. Heavy gauge steel and zinc-plated after fabrication. Available in six sizes from ½ to 2″ for thin-wall conduit, and seven sizes from ⅜ to 2″ for rigid conduit and pipe.
Circle No. 124 on Reader Service Card

Diesel Engine

Product: Series 100 24-hp diesel engine for refrigeration applications such as mechanically refrigerated railway "reefers".

Manufacturer: Witte Engine Works Oil Well Supply Div., United States Steel Corp., Kansas City, Mo.

Features: Two horizontally-opposed cylinders. 25¼″ high. Support pads are spaced far apart for secure mounting and stability. At 1800 rpm, unit produces 18 hp during continuous, 24-hour operation and will provide 24 hp maximum for intermittent service. Vibration practically has been eliminated. Runs under full load without hold-down means. Allowable speed range 600 to 2400 rpm. Water-cooled, 4-cycle unit with 4″ bore and 4″ stroke with resultant displacement of 100.5 cu. in. Weighs 700 lbs.
Circle No. 125 on Reader Service Card

Multi-Torch Chest

Product: Combination (4-in-1) of LP torch tools in metal chest.

Manufacturer: Turner Brass Works, Sycamore, Ill.

Features: Contains enough burner tips to meet every torch application, manufacturer says. Includes regular torch, heavy duty burner, chisel soldering tip, flame spreader, and metal case.
Circle No. 126 on Reader Service Card

Time Switch

Product: General purpose time switch (Model TSA-555) with multi-tripper dial for extreme flexibility of time setting.

Manufacturer: General Electric Co., Schenectady, N. Y.

Features: Permits use wherever many varied on-off schedules are required during 24-hour period. Intermittent contacts (optional) permit application for refrigeration and air conditioning, and heating. Trippers are fixed permanently in timer dial. Cannot be dislodged accidentally, but pressure of screw driver blade at right stress point permits simple removal and relocation of trippers, manufacturer says. Slots are placed at each ¼-hour point on dial to per-

Nor-Lake, Inc. 2nd & Elm, Hudson, Wis. (Phone: Hudson 523)

Please rush FREE illustrated literature on: **Freezers** ☐ **Refrigerators** ☐ **Coolers** ☐

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IT'S **NOR-LAKE** FOR **ALL** YOUR REFRIGERATION NEEDS

Find out which unit suits you best
Mail coupon for FREE literature

REFRIGERATORS—Handy "Reach-In" refrigerators. All have special moisture evaporator that eliminates need for drain connection, adjustable wire shelves, heavy duty blower coil that maintains constant temperature. *Three sizes!* All have thick Fiberglas insulation, embossed aluminum interiors and heavy-gauge steel exteriors.

FREEZERS—Big 27 cu. ft. capacity upright freezer shown. Offers high density Fiberglas insulation and individually copper-tubed shelves for faster, more uniform freezing. Heavy-gauge steel construction with aluminum liner and shelves. Heater strips around door prevent sweating. Models down to 20.2 cu. ft.

COOLERS—Here's a full line of Fiberglas insulated beverage coolers with disappearing doors. This beautiful Lo-Boy Cooler is just one of many that can save you space, time, money. 9 models of Slant-Top Coolers with recessed bases and complete stainless top construction are also available. Discover Nor-Lake. Mail coupon today.

Nor-Lake also builds the finest walk-in coolers, cube makers, beer taps and bottle dispensers. Complete line available in stainless steel.

For better freezing, cooling or storing, look to the nation's northland and—

NOR-LAKE, Inc. Hudson, Wisconsin

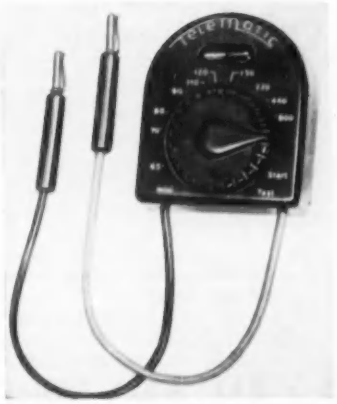
Circle No. 36 on Reader Service Card

mit maximum flexibility of timing schedules. Voltage is 120, 240, 480 and frequency is 60, 50, or 25 cycles. Power source is 4-watt "Telechron" motor with greased rotor for positive operation from –50 F to plus 150 F. Supplied with mechanism alone or with windowless, weatherproof case, making it suitable for virtually all outdoor applications. Operations on any day of the week can be omitted repeatedly and device may be added in the field.

Circle No. 127 on Reader Service Card

Voltage Tester

Product: "Mini-Test", pocket-size voltage tester used for checking unknown voltages from 65 to 800 volts, a.c. and d.c. currents.



Manufacturer: Omega Products, Chicago, Ill.

Features: Easy to use. Voltages are read directly from dial, no guess work. Hands are free to work while unit is being used due to new clip-on leads. Five-year guarantee.

Circle No. 128 on Reader Service Card

Flexible Hose

Product: "Lin-Lok" line of "Teflon" flexible hose assemblies.

Manufacturer: Mic-Lin Co., Maple Shade, N. J.

Features: Chemical resistant. Consists of Teflon liner encased in stainless steel wire braid with full flow fittings permanently locked to hose. Operating pressures up to 400 psi at temperatures from minus 100 to 500 F. Recommended for use wherever maximum chemical resistance, freedom from contamination, wide temperature and pressure range, nonageing, flexibility, and ruggedness are prime requirements. Available in eight sizes from stock ranging from 3/16 to 1⅛" with maximum length of 50'.

Circle No. 129 on Reader Service Card

Utility Truck Body

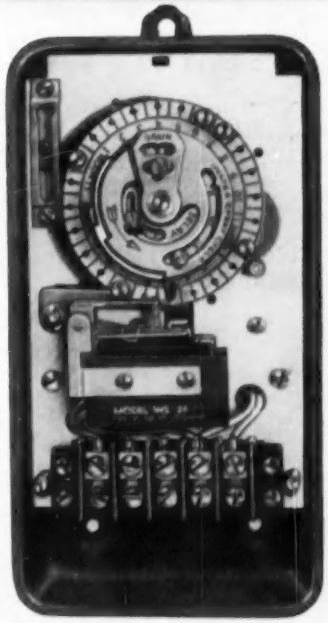
Product: Model UB utility truck service body.

Manufacturer: Utility Body Co., Oakland, Calif.

Features: 15" compartments with shelves and trays hold tools and 4' wide bed with die-formed, anti-buckling, heavy-duty-plate floor

provides added strength with less dead weight. Double panel doors are hinged to body on free-moving bearings. Flush, pull-out-type door han-

install WS-24 dual dial control



for variable water-spray defrosting

Paragon WS-24 de-frost-it gives users complete freedom to change frequency of defrost and length of water spray — 1 to 24 defrost cycles per day. Meets *any* seasonal demand. After installation, you permanently lock "delay" and "drain" settings for completely trouble-free service.

And, WS-24 lists at the popular price of only $34.50—another profitable recommendation!

- Bottom dial controls *frequency* of defrost cycles according to time of day. Top dial controls *duration* of cycles in three adjustable periods: delay, water spray and drain.
- Heavy-duty, industrial-type motor.
- Fast, easy connections.
- For locker plants, Unit coolers, Walk-in boxes, Fur Storage, Breweries, Dairies.

Order WS-24 and these other Paragon favorites from your jobber, or write Paragon.

Commercial Defroster

Dehumidifier Timer

7-Day Calendar Dial Time Switch

Fan Timers

PARAGON ELECTRIC COMPANY

1688 TWELFTH STREET TWO RIVERS, WISCONSIN

WORLD'S FOREMOST MANUFACTURER OF TIME CONTROLS

Circle No. 37 on Reader Service Card

dles with slam-action catches and master-keyed cylinder locks. Exterior surface is acid-etched to clean and protect metal, then primed with non-flaking primer to prevent rust.

Circle No. 130 on Reader Service Card

Electric Hammer

Product: Portable electric rotary hammer which uses shock waves to drill.

Manufacturer: Demo-Haines Tool Corp., Enid, Okla.

Features: Creates over 36,000 shock waves a minute. Cuts clean, true hole up to 40′ depth through hardest stone, rock, or even reinforced concrete. Weighs approximately 10 lbs. Requires no pressure. Difficult overhead or horizontal work is handled easily. Designed for drilling 3/16 up to 1½″ diameter in concrete or masonry for steel pipes, slug-ins, and electric installations. Ground-hardened shafts operate on grease-sealed ball bearings which insure long life and practically maintenance-free operation.

Circle No. 131 on Reader Service Card

Truck Lift Gate

Product: Lift gate for large trucks handling relatively light but bulky loads.

Manufacturer: Anthony Co., Streator, Ill.

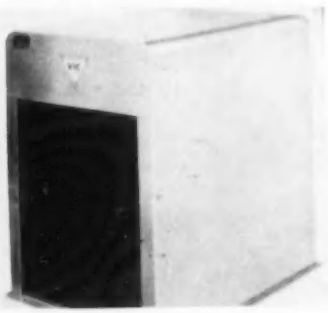
Features: Loading area of 82 x 30″ and lifting capacity of 1000 lbs.

One hydraulic cylinder does lifting and lowering and is powered by battery driven pump or power take-off and pump combination. Loading and unloading can be done from side, even at curb level. Lifting and lowering operations are controlled by one lever from either side of truck thus operator can load and operate gate away from line of traffic. Gate stops automatically at ground and truck floor levels or can be stopped and held at any intermediate height.

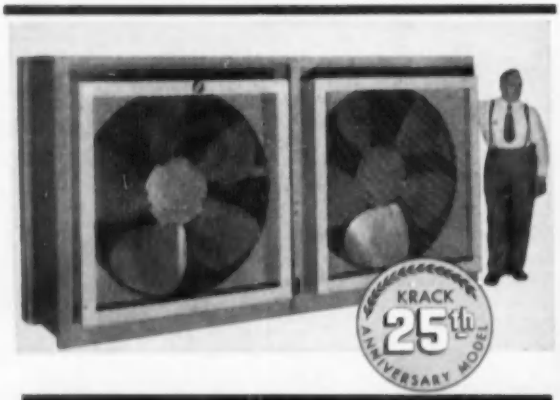
Circle No. 132 on Reader Service Card

Water Chiller

Product: Addition of 5 and 7½-ton units to water chiller line de-



signed for cooling solvents in cleaning plants where use of cold water is exceedingly heavy.



new KRACK air cooled condenser

Now available in capacities up to 30 tons.
No need to use an oversize condenser.

SPECIAL FEATURES

1. Rust resistant
2. Semi-automatic belt adjustment
3. Counter-flow refrigerant circuiting
4. Minimum maintenance
5. Multi circuiting at no extra cost

Phone or Write for New Bulletin Today!

KRACK REFRIGERATION APPLIANCES, INC.

905 West Lake St., Chicago 7, Ill. MOnroe 6-1141

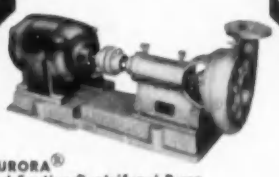
Pioneers in Refrigeration and Air Conditioning Since 1931

614

Circle No. 39 on Reader Service Card

MANY DUTIES • ALL WELL DONE

A Versatile Performer Wherever Liquids are Used



AURORA® End Suction Centrifugal Pump

Discharge may be at any of eight positions. Only the pump end need be of special metals to handle corrosives. Combines numerous quality features for extra years of service. Capacities to 1800 G.P.M.; Heads to 190 ft. Write for Bulletin 107-M.

AURORA always PUMPS

DISTRIBUTORS IN PRINCIPAL CITIES

AURORA PUMP DIVISION
THE NEW YORK AIR BRAKE COMPANY

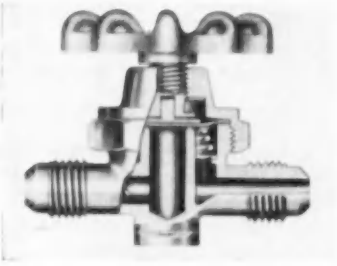
21 LOUCKS STREET • AURORA • ILLINOIS

INTERNATIONAL SALES OFFICE, 50 WEST ST., NEW YORK 6, N. Y.

Circle No. 38 on Reader Service Card

Manufacturer: Vic Cleaning Machine Co., Minneapolis, Minn.
Features: Unaffected by outside temperatures or humidity. For use in many ways and in a variety of combinations. Line also includes 1, 2, and 3-ton models.
Circle No. 133 on Reader Service Card

Diaphragm Valve
Product: Small, compact diaphragm packless valve (Types 515 and 516) engineered for unrestricted flow. Recommended for refrigeration service.



Manufacturer: Henry Valve Co., Melrose Park, Ill.
Features: Available in ¼ through ⅝" flare and O.D.S. sizes, and also can be furnished with other types of end connections. Light in weight. Forged brass body with integral mounting flange. Full capacity ports with inlet and outlet ports-in-line. Nonrotating, floating bearing plate. "Teflon" diaphragm. Stainless steel spring. Hexagonal wrench grip on valve bonnet.
Circle No. 134 on Reader Service Card

Colored Display Cases
Product: "Superline" Refrigerators (Model STIIR) in four colors, shell pink, frost blue, mint green, and golden yellow — also in white.

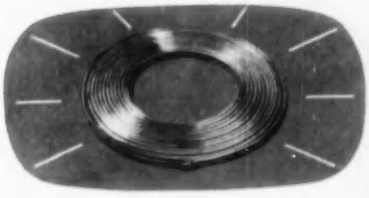
Manufacturer: Friedrich Refrigerators, Inc., San Antonio, Tex.
Features: "FloatingAir" system controls circulation, humidity, and refrigeration. Exterior surface is finished in five-coat baked enamel. Sloped case front allows greater shopping ease and eye appeal. Stainless steel combination hand rail and basket guard rail on front. Variety of 70 and 54" superstructures are available. Matching equipment, designed and engineered for produce, dairy, and frozen food.
Circle No. 135 on Reader Service Card

Seamless
UNITED ALUMINUM TUBE

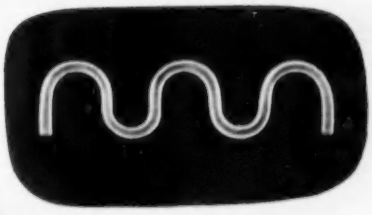
...all the features you want

at a low cost per foot!

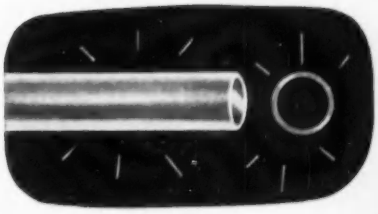
Here's what you get when you specify and buy quality-controlled United Aluminum Tube:



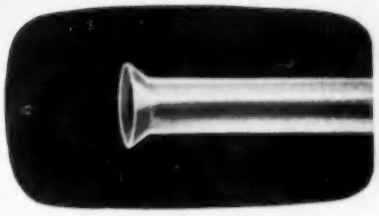
EXTRA-GOOD, commercially bright, clean surface.



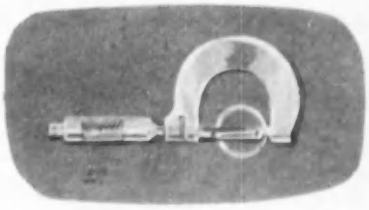
UNIFORMITY OF TEMPER
(the best in "bendability")



CLEANLINESS — inside and outside, with square ends "commercially free from burrs."



EASILY FLARED without cracking or splitting.



CLOSER TOLERANCES that give you more footage of United Aluminum Tube per pound, and earn you a lower cost per foot!

Add to these, speed of delivery, no charge for cut-to-length from 36" up and you'll agree with the host of appliance manufacturers who specify and buy United . . . the quality name in aluminum tube.

Permanently United

UNITED WIRE
AND SUPPLY CORPORATION

PROVIDENCE 7, R. I. • OFFICES IN PRINCIPAL CITIES

LOOK TO UNITED FOR THE BEST IN ALUMINUM, COPPER AND BRASS TUBE AND WIRE

Circle No. 40 on Reader Service Card

8 FIRMS ARE ELECTED TO NEW INDUSTRY GROUP

Five Canadian and three United States manufacturing firms have been elected to the newly formed Air Moving and Conditioning Association. Canadian firms, all located in Ontario, are: American-Standard Products Ltd., Windsor; Canadian Blower & Forge Co., Kitchener; Sheldons Engineering Ltd., Galt; B. F. Sturtevant Co. of Canada, Galt; Trane Co. of Canada, Ltd., Toronto.

U. S. manufacturer-members include: Modine Mfg. Co., Trane Co., and L. J. Wing Mfg. Co.

Chairmen and vice chairmen have been elected by the Air Moving and Conditioning Association for each of its six product divisions. They are:

Central Station Air Conditioning Unit Div.—chairman, F. W. McKenna, chief engineer of Kennard Corp.; vice chairman, L. A. Macrow, manager of the Systems and Equipment Dept. of Machinery and Systems Div., Carrier Corp.

Centrifugal Fan Div. — chairman, R. A. Wasson, vice president and general manager of Clarage Fan Co.; vice chairman, E. W. Petersen, vice president of sales, American Blower Corp.

Industrial Axial and Propeller Fan Div. — chairman, E. C. Englert, sales manager, Hartzell Propeller Fan Co., Div. Castle Hills Corp.; and vice chairman, M. L. Aitken, general sales manager, Robbins & Meyers, Inc.

Power Roof Ventilator Div. — chairman, J. P. Johnson, sales manager, Ventilating Div. of Swartwout Co.; vice chairman, W. Rutter, chief engineer, Burt Mfg. Co.

Residential Fan Div. — chairman B. G. Krause, manager of Air Controls, Inc., Div. Cleveland Heater Co.; vice chairman, P. T. Finch, sales manager of Hunter Fan & Ventilating Co., Inc.

Unit Heater Div. — chairman, T. L. Arnold, sales manager of Heating Div., Fedders-Quigan Corp.; vice chairman, J. J. F. Merrick, division sales manager of John J. Nesbitt, Inc.

All six division chairmen also were elected directors of the association for one year, beginning Jan. 1, 1957.

$13 MILLION SPENT ON NEW TRANE BUILDINGS

Trane Co.'s building program for 1956-57 has hit the $13 million mark with the announcement of plans to double its present research and testing facilities, the "House of Weather Magic", and to build two new manufacturing plants—one to produce brazed aluminum special heat transfer units and the other to make low horsepower air conditioning compressors.

Expansion of the test center is being accomplished in two steps, first of which is nearing completion. The second, a 24,000-sq.ft. project, is scheduled for 1957. Plans and specifications have been drawn with construction and equipment costs estimated at $600,000.

The new brazed aluminum production facilities will encompass 68,800 sq.ft. of manufacturing space with completion scheduled for mid-1957.

The new compressor plant is expected to run about 60,000 sq.ft.

Today's gauge for today's job on those Freon systems. Highly accurate and built down to the last detail to *stay* accurate.

The corresponding temperature scales are in color. Note the wide ranges of sizes and readings in F-12 and F-22 types.

Here is the gauge for permanent installation on refrigeration systems . . . with the Marsh "Recalibrator" to keep it permanently accurate. Write for facts or ***See Your Jobber***

Wide Range of Sizes and Pressures

- Dial sizes: 2½", 3½" and 4½" for Freon-12 or Freon-22. Dial size, 2½" only for gauges with both Freon-12 and Freon-22 scales.
- Dial range for pressure gauges: 0-300 lbs. and 0-400 lbs. For compound gauges, 30" x 150 lbs., 30" x 300 lbs., 30" x 400 lbs.
- All gauges have "Recalibrator." All except 3½" and 4½" gauges standard with ⅛" male bottom connection and restriction screw in socket. 3½" and 4½" gauge have ¼" N.P.T. connection.

MARSH INSTRUMENT CO. Sales Affiliate of Jos. P. Marsh Corporation
Dept. P, Skokie, Ill. • Marsh Instrument & Valve Co. (Canada) Ltd., 8407 18th Street, Edmonton Alberta • Export Dept., 3501 Howard Street, Skokie, Ill.

MARSH Refrigeration Instruments

GAUGES • WATER REGULATING VALVES • SOLENOID VALVES • HEATING SPECIALTIES

Circle No. 41 on Reader Service Card

Carrier's Great New Chipmaster Makes a New Kind of Ice!

Carrier Chipmaster, above, water cooled, has 500-lb. capacity. Air cooled model has 400-lb. capacity, at 90 degrees air, 70 degrees water, temperatures. 34" wide x 75" high x 30" deep. Storage bin capacity: 200 lbs. ¾-hp. hermetic compressor. Models for 110 or 220 volt A.C.

1. Crystal-clear chips! If you think there's nothing new under the sun, you haven't seen the new Carrier Chipmaster or the exclusive new kind of ice it produces! Ice that's mighty easy to sell, which means it's a fast-selling machine! Here are thin, flat, clear chips of solid ice, turned out continuously and automatically. Here are chips that pack well, are easy to scoop and pour, do not freeze together into clumps, give fast cooling with their large cooling area. And talk about uses—think how this sparkling ice will add new zest to all kinds of drinks, new eye appeal to everything from salads to seafoods in lunch counters, cafeterias, soda fountains, restaurants, supermarkets, motels, hotels, hospitals!

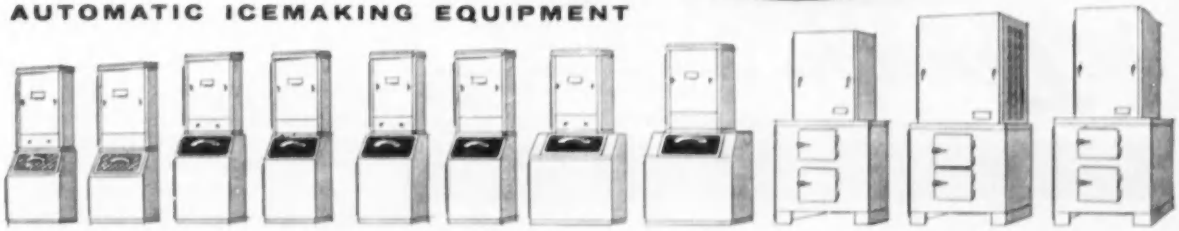
2. Rounds out the really complete line—Carrier! You can say "sure, we've got exactly what you want!" to every single customer, if you're the man who sells Carrier's 13 icemaking machines. Carrier means: the Icemaker for cubes and three grades of crushed ice . . . the Flakemaster for dry, extra-cold flaked ice . . . and the Chipmaster!

3. Plus certified capacity! No vague promises! Carrier gives a written pledge that the unit will deliver a specific number of pounds of ice, under actual local temperatures of water and air; with every Carrier Icemaker, that's your clincher every time!

Want to get in the chips with the Chipmaster—and the complete Carrier line? You'll find your Carrier Distributor in the Classified Telephone Directory. Or write: Carrier Corporation, Syracuse, New York.

Carrier

AUTOMATIC ICEMAKING EQUIPMENT



Circle No. 42 on Reader Service Card

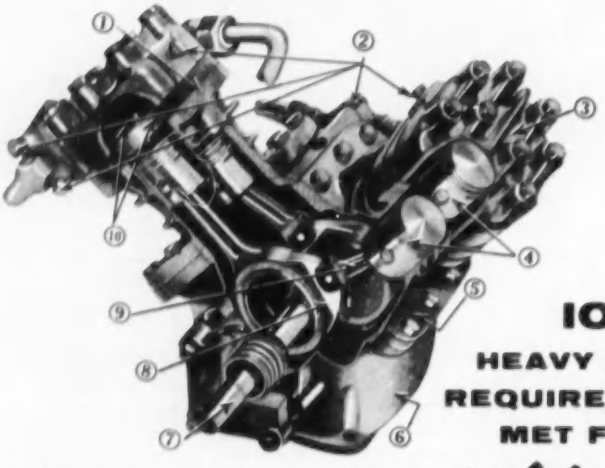
FOGEL PRODUCTION RESUMED AFTER FIRE

Production and deliveries have been resumed at Fogel Refrigerator Co., Philadelphia, following a $500,000 fire which destroyed two of the seven buildings at the company's main plant.

Four days after the early-morning seven-alarm blaze on Oct. 18, production had been returned to 50% of normal, according to William Fogel, president. He credited the quick return to production to the efforts of company workers, from executives on down, who went to work to clean up debris, restore electrical lines, and set things up for normal production activity.

The fire destroyed buildings housing woodworking, sheet metal, small parts and glass departments. Remaining five buildings in the plant cluster were not damaged by fire.

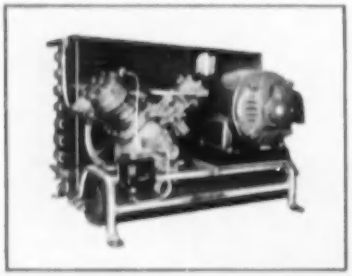
Plans for construction of a $1 million structure are being accelerated as a result of the fire. The building will rise on a one-acre site adjoining the burned-out buildings, and now a parking lot. Fogel hopes to have foundations laid soon, and is pushing for completion by next spring. Expansion plans had been in the works, but the fire pushed them ahead two years, Fogel said.



10 HEAVY DUTY REQUIREMENTS MET FULLY by Lehigh

Don't shortchange that Heavy Duty Job!

Ask your Lehigh jobber to show you the new Lehigh units with this back-saver base. It not only chops off many pounds of useless dead weight but has many other advantages. It gives complete accessibility to all compressor and motor parts. It gives faster and greater sub-cooling by increasing the air-flow over the receiver. It makes inspection and cleaning easier. It adds rigidity and strength to the unit — and it is less costly to ship. Now on all heavy-duty models ⅓ H.P. thru 1 H.P., air and water cooled. Coming soon 1½ thru 3 H.P.



1. Controlled gasket thickness assures uniform piston valve-plate clearance.
2. Choice of connections permits convenient installation of control lines.
3. All castings of finest close grained electric furnace grey iron from Lehigh's own foundry.
4. Lehigh heavy duty units from ¾ H.P. thru 5 H.P. are equipped with multiple compression rings.
5. Removable cylinder block. No need to remove compressor body from system to service, repair or clean crankcase area. A real time and labor saver!
6. Larger crank case capacity assures ample oil supply for continuous heavy duty operation.
7. Heavy duty hardened shaft to controlled straightness.
8. All oversize bearing areas — an assurance of longer, trouble-free wear.
9. All moving parts controlled to .0005 tolerance throughout.
10. Valve plate precision ground and lapped. Reeds are finest Swedish steel.

Lehigh TRU-COLD

Lehigh MANUFACTURING CO.

DIVISION OF LEHIGH, INC. *plant:* LANCASTER, PENNA.

EXPORT DEPARTMENT, 13 E. 40th STREET, NEW YORK CITY

Circle No. 43 on Reader Service Card

COLLEGE COURSES COVER HEATING AND COOLING

College short courses combining lecture and lab work will be held at various schools January through May, sponsored by National Warm Air Heating and Air Conditioning Association. Three problems concerning heating and/or cooling of a five-room-and-bath bungalow, a larger residence, and a semi-commercial building will be presented at every course.

Schools and dates are: Penn State University, University Park, Pa., Jan. 23-26; Washington University, St. Louis, Mo., Feb. 4-7; Oklahoma A & M, Stillwater, Feb. 18-21; Purdue University, Lafayette, Ind., March 11-14; Michigan State University, East Lansing, March 25-28; Long Island Technical and Agricultural Institute, Farmingdale, Long Island, N. Y., April 1-4; University of Omaha, April 15-18; Syracues (N. Y.) University, April 23-26; and University of Connecticut, Storrs, Conn., April 29-30 nad May 1-2.

Information can be obtained by writing Chairman of Warm Air Heating and Air Conditioning Short Courses at the school you wish to attend.

400 ATTEND CRYOGENIC ENGINEERING MEETING

More than 400 scientists and engineers attended the recent Cryogenic Engineering Conference dealing with problems of engineering research and development at temperatures below 150 K –190 F).

Held at the Boulder (Colo.) Laboratories of the National Bureau of Standards, discussion pertained to 50 topics of current interest in the fields of cryogenic processes, equipment, properties, applications, and bubble chambers.

GET PEAK DISTRIBUTION

regardless of Load or Number of Circuits

Buy SPORLAN REFRIGERANT DISTRIBUTORS *with these* 11 *Proven Features!*

1. Sporlan Distributors give the best possible distribution under all conditions regardless of load, number of circuits or evaporator temperature.

2. The Sporlan Refrigerant Distributor is a separate device from the valve, permitting the use of any standard thermostatic expansion valve. No moving parts.

3. Capacity may readily be varied because Sporlan offers interchangeable nozzles.

4. Requires very little space and is easy to install, because all connecting tubes are grouped close together and come off in the same direction.

5. May be applied to any make multi-circuit evaporator. May be installed in any position for any load or evaporator temperature.

6. Wide variety of number and sizes of circuits. Easy selection.

7. Allows internal visual inspection of solder joints at distributor.

8. Permits insertion of test wire to check against plugging of solder joint at evaporator connections.

9. Permits final submerged coil leak test with high pressure before attaching valve.

10. Small body is easy to solder or weld.

11. Steel or aluminum bodies are available in certain distributor types for Ammonia and other special applications.

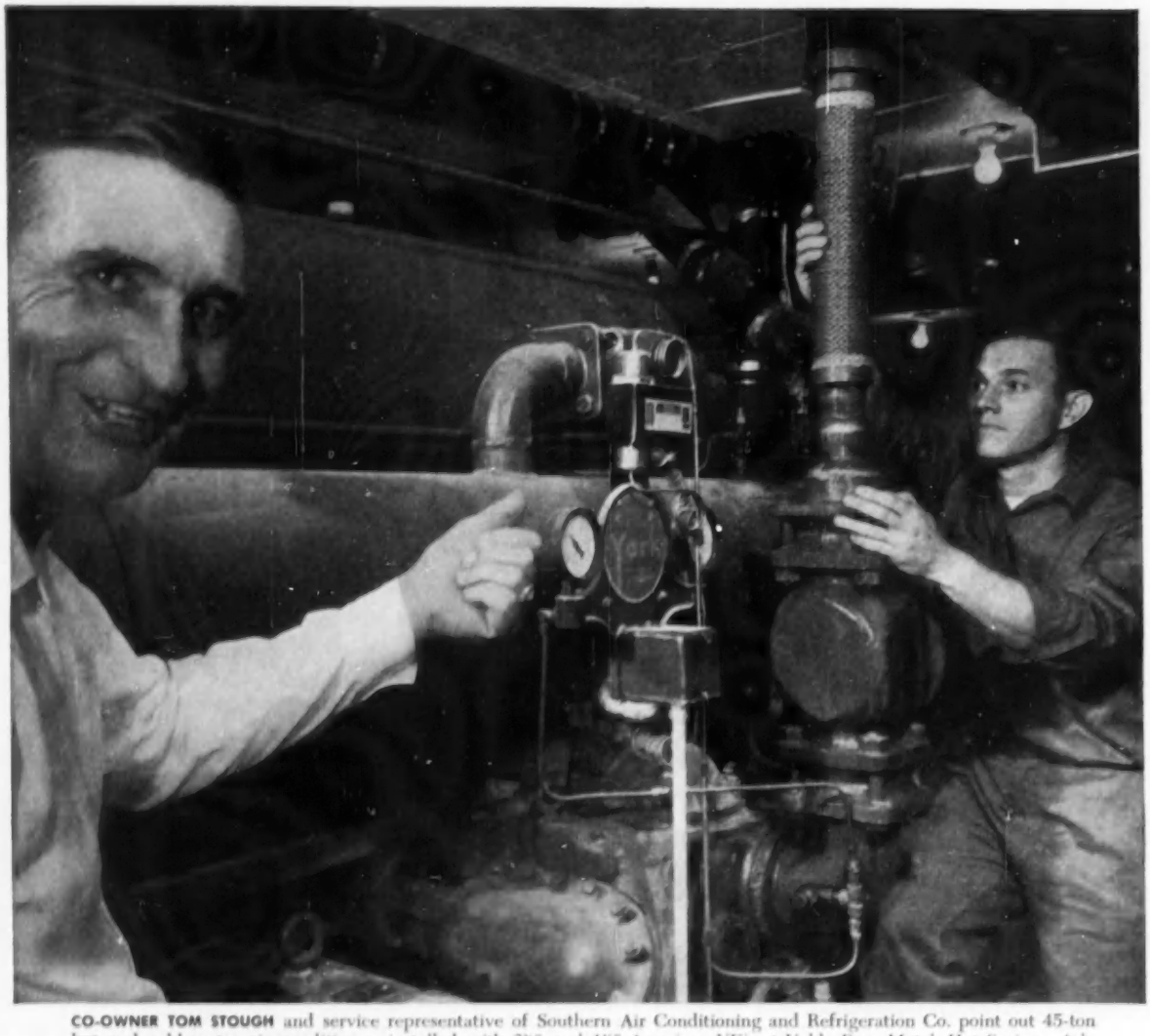
So . . . whether you are a packaged unit or coil manufacturer, contractor or service engineer . . . Sporlan is the Refrigerant Distributor for you . . . Over 15 years of Peak Performance Leadership speaks for itself.

SPORLAN VALVE COMPANY

7525 SUSSEX AVENUE ST. LOUIS 17, MO.

EXPORT DEPT., AD. AURIEMA INC., 85 BROAD STREET, NEW YORK 4, N. Y.

Circle No. 65 on Reader Service Card



CO-OWNER TOM STOUGH and service representative of Southern Air Conditioning and Refrigeration Co. point out 45-ton hot and cold water air conditioner, installed with 2⅛" and 1⅜" American VE's at Velda Rose Motel, Hot Springs, Ark.

"Bar costly return service calls with American Vibration Eliminators"

recommends Tom Stough, Co-owner, Southern Air Conditioning and Refrigeration Co., Hot Springs, Ark.

"Since we first began installing American VE's on our jobs four years ago, we have never had a service call . . . never had a gas loss traceable to malfunctioning of the Vibration Eliminators.

"Take the Velda Rose Motel here in Hot Springs, for example. We installed 45-ton and 24-ton systems protected by 2⅛" and 1⅜" American VE's, 2½ years ago . . . and there has not been one iota of damage due to vibration. No noise, either, to bother guests!"

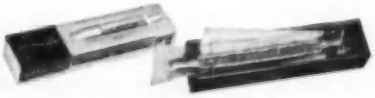
You can use American VE's with confidence because—

The right metal does the job. The special tin-bronze alloy—the result of American Brass metallurgical know-how—is tailored for the refrigeration and air conditioning industries.

Double braid where extra protection is needed. On all American VE's 2⅛" or larger.

Clean, dry, tested, protected. Snip the end of the vaporproof polyethylene bag and you have a factory-fresh unit to install . . . clean, inside and out!

Packaged for your convenience, protection. The new boxes are sturdy, easy to open, easy to identify. Insist on VE's with the stamping "American" on the ferrule . . . an Anaconda product.



NOW listed by Underwriters' Laboratories through sizes 3⅛" O.D.

For descriptive folder write: The American Brass Co., American Metal Hose Division, Waterbury 20, Conn. In Canada: The Canadian Fairbanks-Morse Co., Ltd. 6AE10

WHEREVER CONNECTORS MUST MOVE

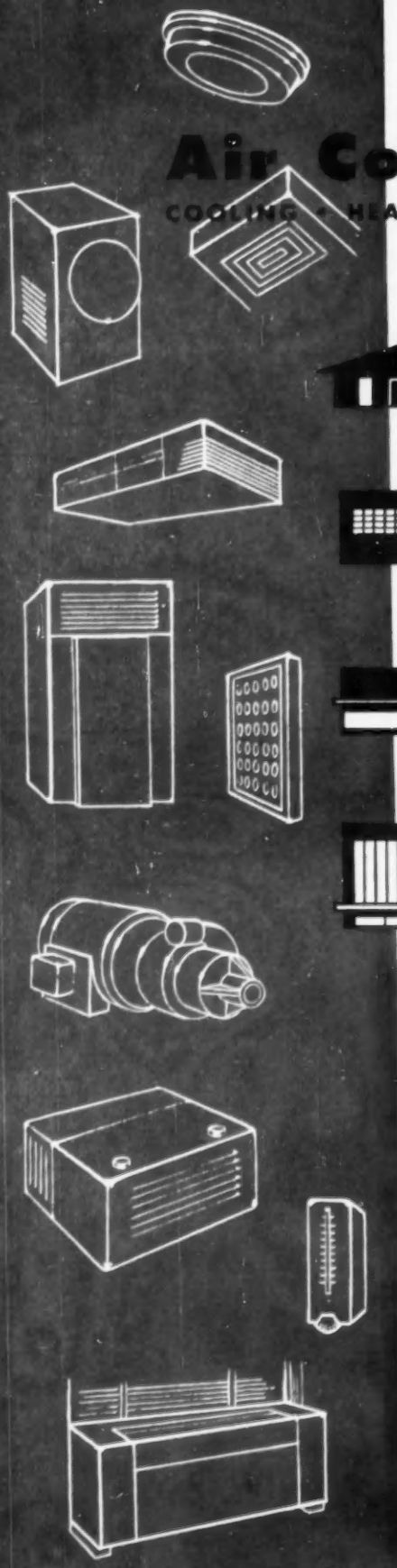
AMERICAN

For American Vibration Eliminators see your

ANACONDA®

DISTRIBUTOR

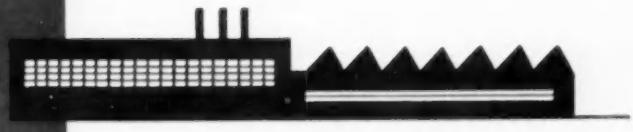
Circle No. 45 on Reader Service Card



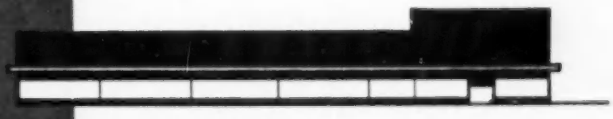
Air Conditioning Section

COOLING • HEATING • CIRCULATION AND HUMIDITY CONTROL

RESIDENTIAL



INDUSTRIAL



COMMERCIAL

INSTITUTIONAL

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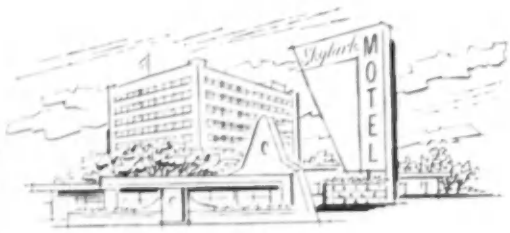
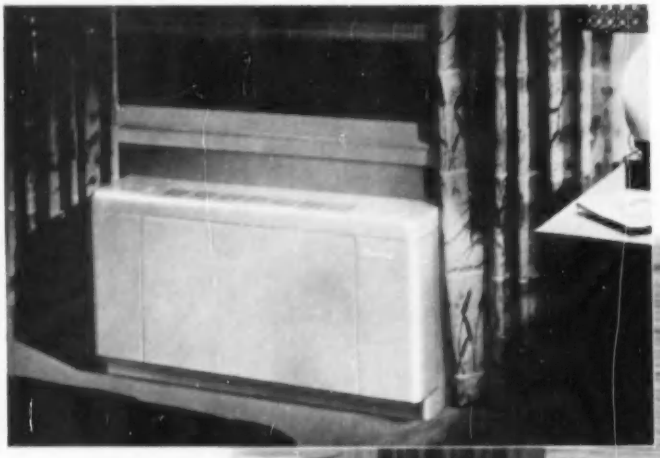


or modernization



Modine AIRditioners are the quiet, fingertip answer to year-round comfort

Successfully combining the most desirable features of *central* and *unit type systems*, Modine AIRditioners have earned wide acceptance among architects, engineers and contractors. Whether it's a new or remodelling job, these men like the individual room control — with the economy of operating from a central boiler and chiller. Slow-speed, resiliently mounted fans provide extra-quiet year-round comfort. And, like all Modine products, AIRditioners are designed and built to meet highest appearance and mechanical standards.

Ask the Modine representative listed in your classified phone book for Bulletin 755 — or write Modine Mfg. Co., 1584 DeKoven Ave., Racine, Wisconsin.

A-1336

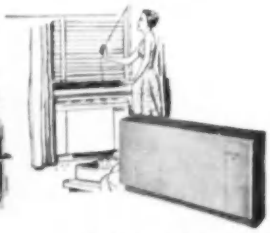
Modine Airditioners®

In Canada: Sarco, Ltd., Toronto

CEILING MODELS
deluxe units for exposed overhead installation. Save floor and wall space.

OVERHEAD MODELS
available with or without plenum and filters for use in furred overhead space.

CONCEALED MODELS
(front panel cut away). Designed for easy, in-the-wall installation below windows.



CONSOLE MODELS
free-standing units can also be recessed so only 6 inches of cabinet shows.

Circle No. 46 on Reader Service Card

New developments in '56

pave way for . . .

More Profits in '57

Here is a summary of some new products and systems that can help you install better jobs with bigger profits

by Edward Dowis

Room Conditioners Feature Notable Design Improvements — Important new developments in the room conditioner field, some of which make them salable for more locations, include the following:

(1) Introduction of thin models which reduce or eliminate projection into the room or outside the wall.

(2) More high power factor, low amperage models.

(3) Reported under test and awaiting release are inverted L-shaped units which hang over window sills and extend downward along walls, rather than extending so far in or out of the window.

A most important decision by manufacturers of room conditioners is to publish capacity ratings in Btuh under standard conditions. This will make it possible to specify units correctly for the job they are expected to do. Selection of equipment on the basis of capacity rather than horsepower will encourage fair competition.

Heat Pumps With Solar Collectors Provide Economical Heating And Cooling — A completely solar heated building has recently been completed in Albuquerque, N. M. Another large building in that city absorbs heat from walls exposed to solar radiation and utilizes it to heat other areas. An experimental system is in operation in an industrial area near New Haven, W. Va., to study the combination of solar collectors and heat pumps for space heating and cooling. The University of Minnesota has established a special laboratory to study the entire field of solar energy utilization. The heat pump is an integral part of each of these installations.

Any heat absorbing surface exposed to solar rays absorbs energy. This absorption can be increased by coating the surface black and surrounding it with black heat-absorbing materials. Covering the exposed surface with glass also may increase its absorption of heat. In some installations heat is stored in water, to be used at night or at other times when solar radiation is low or absent. Hot water also can be provided economically by solar heat pumps.

As operational and cost data are obtained in various geographic locations, it is confidently predicted that mechanical heating-cooling systems will become progressively more efficient and, hence more widely used.

Improved Cleaning And Purifying Equipment Developed For Room Conditioners — Removal of odor causing vapors as well as solid containments is now possible with room conditioners. Filters which include activated charcoal are available to replace those which remove solids only. It is reported that activated carbon filters are effective in removing not only odors of internal origin but external ones such as exist in smog areas.

Permanent filters which develop electrical charges through friction are said to attract particles smaller than those trapped by conventional filters. The accumulated dirt can be washed off with water.

Several current models of room conditioners feature electronic filters. Ionization is included in the electronic treatment of air in some models soon to be released. Negative ionization has been found, in hospital tests,

to relieve allergies, notably hay fever, which are due to airborne materials.

One conditioner will combine an aluminum mesh filter, an activated charcoal odor adsorber, and an electronic ionizer. These improvements are largely the result of progressive research, conducted in 1956 and continuing, in the following fields:

(1) Development of a small power pack which can convert standard voltage a.c. to high voltage d.c.

(2) Wider application of activated carbon odor adsorbents.

(3) Improved mechanical filters.

(4) Friction-type electrostatic filters.

(5) Medical research in the field of airborne containments as related to health and comfort.

New Thermostat Senses Average Duct Temperature — Conventional duct thermostats have the disadvantage of controlling temperature only at the location of the bulb. This is often quite different from the mean temperature of air flowing through a duct, and it is difficult to find a location which will always control average temperature.

A new thermostat has, as the sensing element, a wire enclosed within a 27' length of ⅛" copper tubing. This tubing can be mounted in the duct as indicated in Fig. 1. The wire is very sensitive to temperature change.

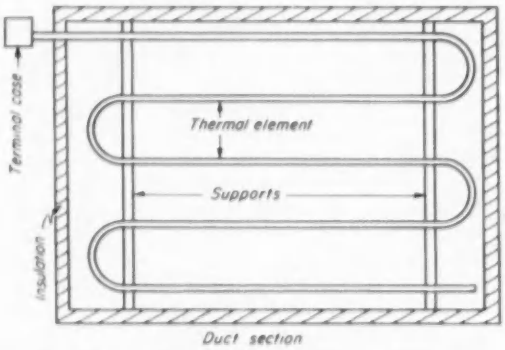


FIG. 1—Resistance thermostat for large ducts.

Through a suitable circuit, this thermostat can operate one or more valves or dampers to maintain a desired average temperature with precision heretofore practically impossible.

Compound Compression Widens Field For Heat Pumps — What is believed to be the first application of compound compression to heating and cooling a building is a feature of the new Heironimus department store in Roanoke, Va. A new office building in Philadelphia uses a similar system. The advantages of compound compression are well known and it is commonly used for low temperature refrigeration.

With compound compression, heat can be extracted from air at sub-zero temperatures by passing over coils of even lower temperature. The first stage of compression brings the regrigerant to a pressure and tempera-

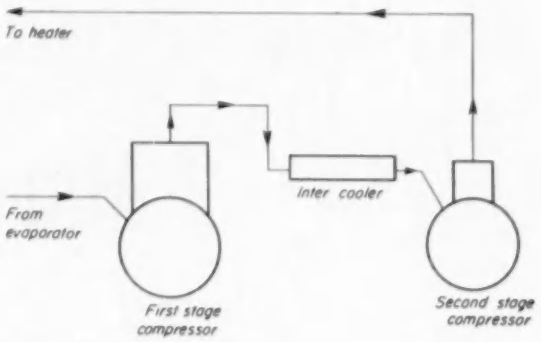


FIG. 2—Compound compression cycle for heat pumps.

ture at which the second stage can handle it efficiently. An intercooler between the stages increases efficiency. The cycle is illustrated in Fig. 2.

It is possible to handle the entire heating load with compound compression in buildings which would otherwise require supplemental heating. Compressors are changed automatically from single to compound compression whenever temperature falls to where it is required.

New Progress In Panel Cooling — The use of pipe coils imbedded in ceilings and walls for cooling is receiving increased attention. Where panels are installed primarily for heating, the only investment required for cooling is that for equipment to supply chilled water. Additional advantages of panel cooling include absence of visible equipment in conditioned rooms, better draft control, quietness and use of higher temperature water.

The main disadvantage of panel cooling is that only sensible heat is removed. Sweating will occur if surface temperature reaches the dew point. Panel cooling is particularly attractive in locations with low dew point temperatures.

The dew point problem is being solved by supplying ventilating air at a low enough dew point to prevent sweating. This is accomplished by passing ventilating air over a dehumidifying coil or through a chemical dehumidifier. One economical method is to pass chilled water first through the dehumidifying coil and then, when the temperature has been raised above the dew point, sending it through wall and ceiling panel.

New Controller Protects Compressors — A new controller has been introduced which protects compressors from lubrication failure. It is adaptable to any compressor with measurable oil pressure lubri-

cation and will stop the compessor in event of oil pressure drop for any period long enough to cause damage. This looks like good compressor insurance and will make a profitable addition to many medium to large size installations.

This controller is essentially a pressure differential device which stops the compressor whenever the difference between suction pressure and oil pressure falls below the setting for a period longer than the normal fluctuations. Air conditioning compressors are particularly subject to lubrication disturbance because of the solubility of refrigerants and the tendency of oil to travel throughout the system. A precise time delay device is incorporated in the controller which prevents stopping during normal periods of low pressure.

Head Pressure Stabilizer Prevents Low Pressure — An effective method of maintaining satisfactory head pressure in all types of air cooled condensing units is illustrated schematically in Fig. 3. Compressor gas is passed through a heat exchanger and thence to the condenser. The heat exchanger has a predetermined pressure drop which prevents liquid from the condenser from passing through it except when the pressure regulating valve is closed.

The pressure regulating valve is set to close when head pressure falls below the minimum desired. This

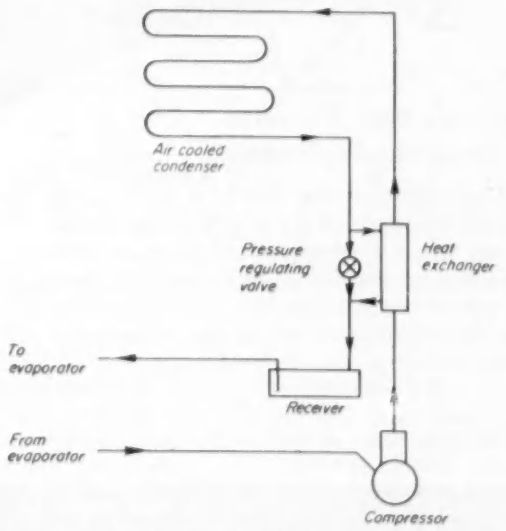


FIG. 3—Schematic circuit of head pressure stabilizer.

forces liquid through the heat exchanger, where it absorbs enough heat from the hot gas to maintain satisfactory operation.

Low pressure is usually the result of low ambient temperature around the condenser. It may prevent solid liquid from reaching the expansion valve or passing through it at sufficient rate for satisfactory operation. Stabilizers using this principle are available in sizes to 7½-hp and should be a valuable addtion to air cooled systems which may operate at low ambient temperature.

Supervisory Data Centers

. . . the "new look" in the control and instrumentation of large-scale air conditioning installations for human comfort

MASTER panels that collect key operating data on air conditioning, heating, refrigeration, and ventilation systems, and also provide for remote control of the equipment from a central point, are being used in many modern buildings to reduce cost and increase comfort. Known as "supervisory data centers", these panels sometimes are made an architectural feature of the building, installed so that building tenants and the general public may observe them in action.

An eye-opening discussion of these integrated control systems, outlining their development and pointing up their current and potential applications, was presented before a recent meeting of the Illinois chapter of the American Society of Heating and Air-Conditioning Engineers by Charles M. Sanders, market manager for electronic controls, Minneapolis-Honeywell Regulator Co.

One of the earliest such "graphic" control panels, Sanders related, was installed in the White House in 1952. Modern types have been designed and built during the past year for many large new office buildings and similar structures. Smaller buildings and rambling shopping centers are utilizing supervisory equipment and techniques, too. So are some existing buildings where extensive modernization work is underway.

In a typical installation, the supervisory panel is mounted in the engineer's office, although in some buildings it is placed on public view in a busy lobby. Here it serves as a reminder to tenants and customers of the steps taken by the management of the building to insure comfort.

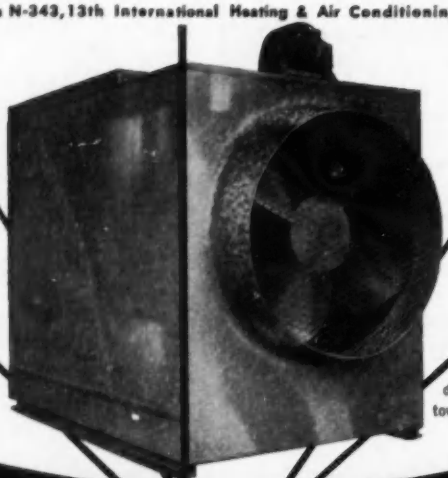
Studies of early installations show that a supervisory data center costs between 2 and 5% of the total cost of a building's heating and cooling systems. Savings in personnel and increased efficiency of equipment usually make it possible to liquidate this cost quickly.

The panels graphically display temperature and humidity of zones or individual rooms throughout the building. Continuous readings of outside air temperature are provided on the central panel. Coils, fans, valves, motors, and other pieces of operating equipment are colorfully and graphically presented.

Dials give information on temperature flow, pressure

Continued on page 86

See the Dover Complete Line in Booth N-343, 13th International Heating & Air Conditioning Exposition, Chicago, Feb. 25-March 1, 1957



Series CF horizontal induced draft tower. Vertical induced draft and natural draft towers also available.

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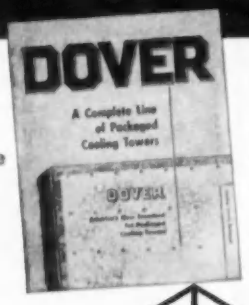

DOVER PACKAGED COOLING TOWERS MEET THE RIGID REQUIREMENTS OF THE NEW YORK CITY DEPARTMENT OF BUILDING

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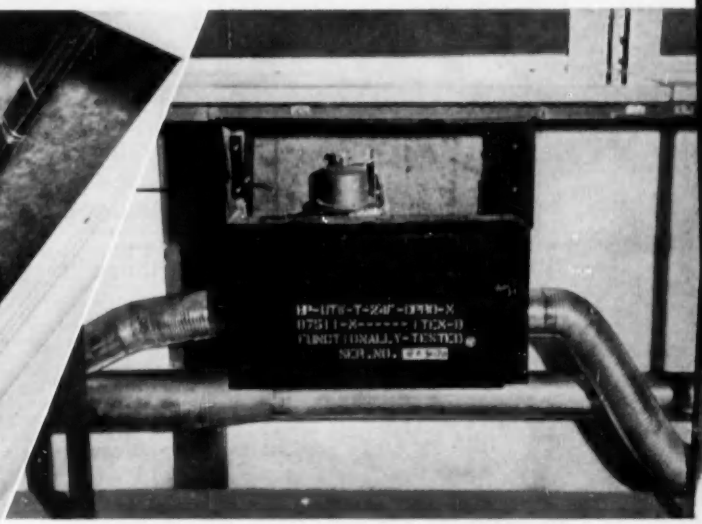
Circle No. 47 on Reader Service Card

flexible duct

it can save time–save money

INSTALLATION engineer finds it easy to fasten to this ceiling-mounted sound box one of the four flexible ducts leading to individual diffusers.



LOCATION of mixing boxes under windows in this high velocity installation was simplified by use of flexible duct to join these boxes to the main duct.

FLEXIBLE ducting is proving itself more and more as a time-saver and a cost-saver on air conditioning installations, particularly those of the high velocity type. While high velocity installations result in savings on building construction by making possible smaller duct sizes and reducing the area required for duct installation between ceiling and floor joists, they also make matters more difficult for the mechanical or air conditioning contractor who is forced to work in the resulting cramped spaces.

Experience has shown, however, that these problems can be simplified somewhat by the use of some type of flexible air duct. The light weight and inherent flexibility of this product, coupled with the fact that no special cutting tools are required to fit it, make it easy to handle in tight spaces. It bends easily around obstacles without distortion, flexing in large, smooth radii resulting in a minimum of pressure drop at curves.

An excellent example of the advantages provided by the use of flexible air ducting for such purposes is contained in the new United Services Automobile Association building in San Antonio, Tex. The air conditioning system in this building is of the double duct, high velocity type, which supplies both hot and cold air to thermostatically controlled mixing boxes. These, in turn, deliver the air to the various rooms through high induction diffusers.

In this installation, "Thermaflex" flexible ducting was used to fabricate the connectors between the hot and cold main ducts and the mixing boxes. Physical requirements of the installation presented numerous difficult problems in alignment between the main ducts and the inlets of mixing boxes or diffusers, but the ready adaptability of the flexible duct to such circumstances saved the installing contractor a great many hours of time—and a corresponding amount of money—on the job.

Specifying flexible ducting for connectors permitted the installing engineers to run main ducts in direct, uncomplicated lines, and to locate mixing boxes and diffusers in the most satisfactory positions from the standpoint of efficient operation. If such locations meant that inlets to the boxes were out of line with branch outlets on main ducts, the connecting ducts were merely flexed to the necessary degree to make the connection with a minimum of fitting problems.

In several of the offices the thermostatically controlled mixing boxes were located under windows and used with grille type outlets. Using flexible ducting to join main ducts with the inlets to the boxes made this type of installation a relatively simple matter.

Another typical example of the applicability of flexible air ducting to installations of this type is the high

Continued on page 86

IT COULDN'T BE DONE

. . . but they did it!

Ingenuity is a prime asset of air conditioning application engineers. Often confronted by obstacles that seem insurmountable, they somehow usually manage to find an answer. For example, witness these three tricky problems and their clever-solutions

WHEN he really puts his ingenuity to work, it seems there's just no problem that today's air conditioning installation man can't solve. Ask him to do things like find space for equipment where there simply isn't any available, or locate air conditioning outlets where they'll do their job but won't be noticed, or use "waste" space for an equipment room—problems like these may keep him awake a few nights, but you can bet he'll eventually come up with an answer that will satisfactorily solve the problem.

For example, take the installation in Bert's Sundries, one of the major stores in the new Westgate Shopping Center at Daytona Beach, Fla. The store wanted air conditioning, but there was no room for equipment either inside or outside. In addition, center owners preferred that no equipment be placed directly on the building roof.

Studying the situation and premises, Arthur Rothkranz, sales engineer for Theodore M. Williams Co., Daytona Beach Air conditioning firm, came up with what might be called a "cooler cradle" solution. Here's how he did it:

Four "I" beams were set on opposite building walls. They serve as a base for the store's atmospheric tower. From the beams extend an angle iron "cradle" that holds a 30-ton Airtemp packaged air conditioner.

Supply duct runs from the unit to the store and laterally the length of the store behind a curtain wall. Duct outside the building is lined with vinyl glass fiber and weatherproofed with a mastic coating. Return duct runs from a bank of return grilles set in the wall. No perceptible noise from the "cradled" unit enters the store, it is reported. Performance of the somewhat unusually arranged system is reported entirely satisfactory.

The problem of locating the heating and cooling duct outlets where they could do their job efficiently but still not be noticed came up in connection with installation of year 'round air conditioning in the new J. I. Holcomb Observatory and Planetarium at Butler University in Indianapolis. The building is divided into an east and west wing, with the latter area containing the planetarium. A circular room, it seats 100 persons and is surmounted by a dome with a 12′ radius.

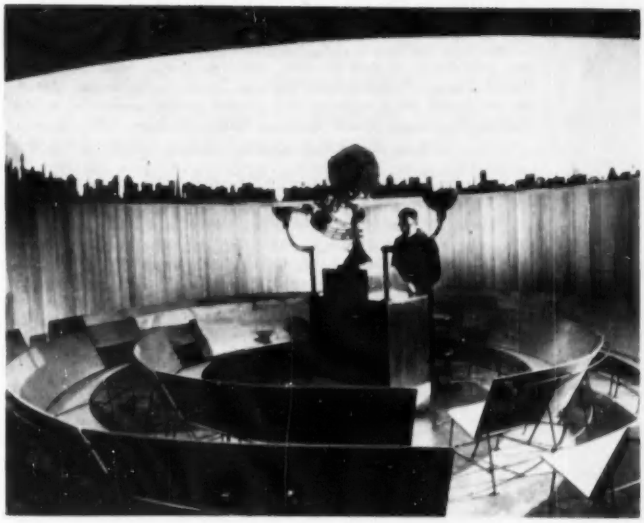
The inside surface of the dome is painted white and is bordered in black by an easily recognizable silhouette of the Indianapolis skyline. Concealed in this skyline are the heating and air conditioning ducts. Air conditioning for the planetarium, and for the office of Dr. Harry Crull, director of the observatory and planetarium, is provided by Bryant residential type equipment.

A dust-gathering, no-longer-used elevator shaft was returned to service in installing air conditioning in the Pottstown, Pa., store of the Levitz Furniture Co. The shaft is used as the location for two 30-ton packaged Airtemp air conditioners.

One of the 30-ton air conditioners was installed in the shaft space on the first floor, and a second in the same space on the floor above. Each unit connects with a ceiling-attached duct which spans the length of the store. A take-off from the main floor duct supplies the basement level with air conditioning, so that the two air conditioners provide three floors of cooling.

By employing the packaged air conditioners and placing them in the unused space, Levitz was able to add air conditioning without major store alterations and without losing an inch of valuable floor display area. Air conditioning equipment for the Levitz store was furnished by S. S. Fretz, Jr., Philadelphia. Installation was made by Pottstown Refrigeration & Ventilating Co.

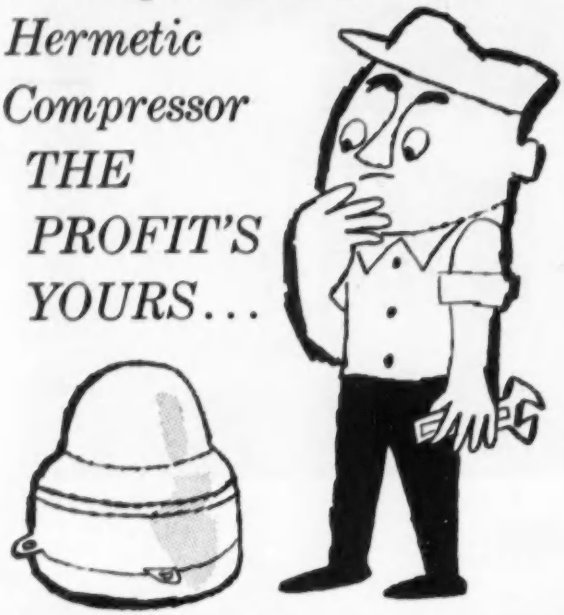
SPECIAL CRADLE suspends a 30-ton air conditioner in this installation at Bert's Sundries, Daytona Beach, Fla. It solved the problem of installing cooling equipment in a location which just "didn't have any room" for it.

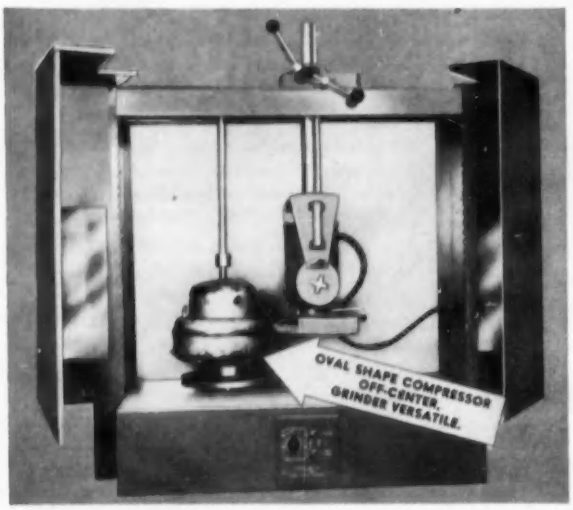


CAN YOU SPOT the heating and cooling duct outlets in this picture? They're cleverly concealed in the skyline silhouette in the planetarium of the J. I. Holcomb Observatory on Butler University's campus in Indianapolis.

ABANDONED ELEVATOR shaft at the rear of the Levitz Furniture Co. store in Pottstown, Pa., provided location for two 30-ton air conditioning units. A take-off from the main floor duct supplies the basement level with cooling.

When you OPEN this Hermetic Compressor THE PROFIT'S YOURS...





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Circle No. 48 on Reader Service Card

USEFUL LITERATURE On Air Conditioning

To obtain the information described below, simply circle on the postcard in this issue the key numbers of the items you wish to receive. We will forward your requests to the companies concerned.

INDUCTION SYSTEM EQUIPMENT by Worthington Corp., is covered in two printed pieces, Bulletins No. C-1100-889 and No. C-1100-890 describing the helical conduit and the spray-type surface humidifier respectively. Important economical features and a list of uses of the helical conduit are outlined. Definite applications, specifications, and physical data comprise the second publication.

Circle No. 103 on Reader Service Card

VOLUME CONTROL METHODS for use with "Airfoil" centrifugal fans for heavy duty industrial applications are described and evaluated in Bulletin No. 4824 available from American Blower Corp. Performance features and construction details are discussed. Also supplied are photos and drawings of wheel, housing, bearings, shaft, bearing supports, and inlet screens.

Circle No. 104 on Reader Service Card

"TIPS ON BLOWERS" is the title of pocket-size folder prepared by Viking Air Products Div., National-U.S. Radiator Corp., which is offered as a helpful reference when installing, adjusting, or servicing any make of blower. Presented are many brief, illustrated tips on adjusting blower speed for heating or cooling, and how to order replacement parts. Checklists offer important items to include when instructing consumer or giving complete blower service.

Circle No. 105 on Reader Service Card

THE "BLACK MAGIC" of activated charcoal made from coconut shells is told in comprehensive catalog compiled by Pur Air Div., Barnebey-Cheney Co. Detailed material is divided into three sections that deal with equipment, applications, and the charcoal itself. Illustrated technical sheets, magazine reprints, cartoons, and very extensive reports are supplied.

Circle No. 106 on Reader Service Card

SPECIAL FEATURES of fan and coil room air conditioners are examined closely in Bulletin No. C-1100-888P produced by Worthington Corp. Elaborate specification data is supported by helpful illustrations. Dimensional information of floor-cabinet and fully-recessed types is included.

Circle No. 107 on Reader Service Card

COMPLETE SELECTION DATA in simplified form on the "MTI" line of industrial cooling towers highlights eight-page Bulletin No. 203 produced by Baltimore Aircoil Co., Inc. Described in detail are the 44 sizes available. Handy chart reflects correction factors of the units.

Circle No. 108 on Reader Service Card

AIR DIFFUSION PATTERNS and installation techniques are photographically illustrated in Lima Register Co.'s 32-page catalog on its complete line of diffusers, registers, and grilles for cooling and heating. Easy-to-read specifications and performance data also are presented.

Circle No. 109 on Reader Service Card

INSTALLATION PROCEDURE of the "Multi-Vent Trofferlite", lighting fixture and air diffuser combination, jointly marketed by Pyle-National Co. and Benjamin Electric Mfg. Co., is explained in new booklet. Publication also provides illumination and sound level charts, and all information needed for proper selection methods.

Circle No. 110 on Reader Service Card

"GOOD BUSINESS LINE" facts are elaborated in the 1957 heating and cooling catalog by Thermo-Products, Inc. Complete literature and specifications along with photos represent all units in oil and gas, counterflows, hi-boy upflows, oil-fired suspended counterflows, and oil and gas floor furnaces. Data on summer air conditioning units is included.

Circle No. 111 on Reader Service Card

PERFORMANCE AND USES of "Microlite" insulation are described in four-page brochure, Form No. WML-5 by L.O.F. Glass Fibers Co. Thermal and acoustical performance charts are presented along with a brief description of how "Microlite" is made.

Circle No. 112 on Reader Service Card

TYPICAL APPLICATIONS of Rittling Corp., back draft dampers are furnished in attractive Bulletin No. BD-56. Outstanding features are listed and dimensions and specifications are included.

Circle No. 113 on Reader Service Card

PRESSURE LOSS DATA which permits engineers to determine true elbow losses throughout air distribution system is listed in Catalog No. F-7912 available from Barber-Colman Co. Catalog on "Uni-Flo Airturn", factory-fabricated, ready-to-install, airturning device designed to give sweeping radius performance to square duct corner, illustrates and describes assembly. Also included is sizing and ordering information.

Circle No. 114 on Reader Service Card

REVISED DATA now is available from Trane Co. in its "Cold Generator" Bulletin DS-352 covering 10 through 150-hp packaged, reciprocating water chiller units. Capacity tables are provided along with information about water-flow arrangements for all types of systems, construction features, controls, and selection factors.

Circle No. 115 on Reader Service Card

TAPERED BACK DESIGN features and dimensional changes are incorporated in Refrigeration Engineering, Inc., Catalog 56C6a on Recold RE low-cost, remote air conditioners. Specifications are given for three sizes, ½, ¾, and 1-ton.

Circle No. 116 on Reader Service Card

HOW TO DETERMINE diffuser capacity is explained in 12-page, Anemostat Corp., bulletin, an addition to Selection Manual No. 50. Titled, "New Products 1956", data is given on remote manual control, ceiling panel-diffuser, straightline 100% aspiration diffuser, high-capacity, vane-type diffuser for high sidewall installation, diffusers for ceiling mounting with center induction and radial distribution, and diffusers with air extraction in the outer cones.

Circle No. 117 on Reader Service Card

DESIGN CHARACTERISTICS of Redmond Co., Inc., AL-4 FHP electric motor are described in detail in four-page brochure. Effective cut-away photo and illustration of Redmond's "TriFlux" design are included. Standard ratings and a dimensional diagram also are supplied.

Circle No. 118 on Reader Service Card

(Turn to page 54 for more Useful Literature)

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I would like to receive complete data. ( )
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Circle No. 49 on Reader Service Card

WHAT'S NEW
in Air Conditioning Equipment

For further information on any of these products, simply circle on the postcard provided in this issue the key numbers of the items in which you are interested. Your request will be forwarded directly to the companies concerned.

(For more New Products turn to page 56)

Line of Furnaces

Product: Line of furnaces, all adaptable for addition of summer air conditioning.

Manufacturer: Worthington Corp., Harrison, N. J.

Features: Available in high-boy, lo-boy, counterflow, and horizontal design, latter adaptable for suspension mounting. Can be belt or direct driven. Available in about 50 different types and sizes, ranging from 80,000 to 350,000 Btuh. Gas or oil-fired. Wide scope of optional features makes units adaptable to accommodate varying conditions of operation for residential and commercial applications.

Circle No. 137 on Reader Service Card

Electric Thermostat

Product: Electric heat thermostat (Type 1A63) for localities that require double pole disconnect switch located at each thermostat.

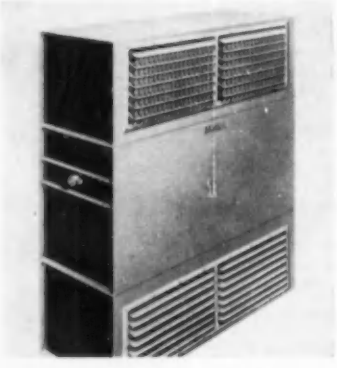
Manufacturer: White-Rodgers Co., St. Louis, Mo.

Features: Control is specially designed for use on cable heat, glass panels, electric baseboards, rubber panels, and similar applications. True "off" dial position at which both sides of 240V line are disconnected, and no temperature change can close contacts. Sensitive element used obtains extremely sensitive reaction to both radiant heat and air temperatures, manufacturer says. Switching mechanism mounts directly into any standard 2 x 3" outlet or conduit box. Control has knob-type temperature selector, and automatically maintains any temperature from 55 to 85 degrees. Rated at 5000 watts 240V a.c. (22 amps) 240V a.c.

Circle No. 138 on Reader Service Card

Heater-Ventilator

Product: Large capacity "Torrivent" heating and ventilating unit for conditioning large areas.



Manufacturer: Trane Co., La Crosse, Wisc.

Features: Sectionalized design makes possible 275 distinct combinations in nine sizes. Units range from basic model for introduction of ventilated air to deluxe model that provides heating, ventilation, and humidification. Wide coil selections provide range of final temperatures. Built to deliver large volumes of air quietly and economically. Has exclusive louver fin discharge grille for variable air discharge patterns. Capacities range from 1150 to 36,000 cfm of air delivery, and from 50,000 to 1,900,000 Btu.

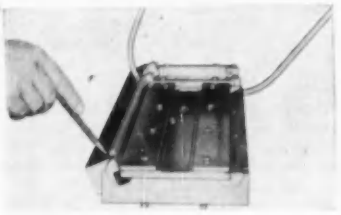
Circle No. 139 on Reader Service Card

24" Cheek-Bender

Product: Cheek-bender for inside corner bends up to 24".

Manufacturer: Bett-Mar Mfg. Co., Hopkins, Minn.

Features: Two-way trunnion at open end assures evenly perfect bends on inside corners. Trunnion also holds bending bar in position making



certain sheet is flat before bend is made. Adjustable plate can be set for bends from ¼ to ⅞" wide. Eliminates hand work on variety of sheet metal production jobs requiring bends on inside corners. Accommodates 24-gauge sheets. Spacers are available for 22 and 20 gauge. Comes with two lag bolts, ready to set up on bench. Shipping weight is 77 lbs.

Circle No. 140 on Reader Service Card

'57 Conditioner Line

Product: Five-model "Deluxeline", also compact "Trimline" series (model shown) measuring only 26" wide, 17" deep, and 20½" high.

Manufacturer: Gibson Refrigerator Co., Div. of Hupp Corp., Greenville, Mich.

Features: "Deluxeline" models range from ¾ to 2-hp. Two-speed fan motor. Air exhaust selector. Also thermostat control, glass-fiber filter, push button control, permanently lubricated fan motor, and low-sound-level operation. "Trimline" models have automatic directional cooling. Behind horizontal louvers which direct air flow from ceiling to floor is set of vertical louvers connected to an oscillator mechanism. Louvers swing in 120-degree movement, fanning air gently from wall to wall and providing even cooling without drafts. Included is 1-hp unit that can be operated on standard household current. Permanent electrostatic filter magnetically attracts dust particles of less than ½-micron size that is renewed by washing with water and detergent, manufacturer says. Can be mounted flush inside, all the way inside, half-way, through-the-wall, or against glass

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This completely redesigned valve is available in five straight-thru and angle types with flare, solder and M. P. T. connections. See them at your wholesalers . . . Take some along . . . and on your next service call install them . . . You can't do better for your customers.

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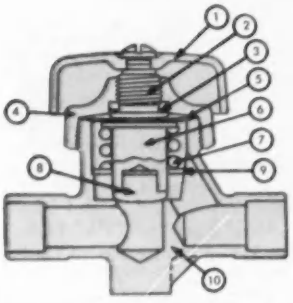
A phosphor bronze diaphragm between two stainless steel diaphragms gives the LINEMASTER an unbeatable combination for super sealing and long life. Diaphragms pressure wear tested for thousands of openings and closings without failure.

2. SUPER SEATING

In the LINEMASTER, tough, resilient molded nylon seat disc insures positive shutoff even if foreign material is lodged against the seating surface. Mueller Brass Co. pioneered and proved the superiority of nylon for "super seating".

PLUS 10 Ways better in design and construction



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197

STREAMLINE PRODUCTS

MUELLER BRASS CO. PORT HURON 10, MICHIGAN

Circle No. 50 on Reader Service Card

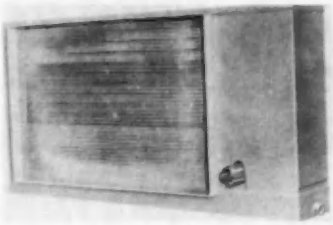
on casement windows. Horizontal-type directional louvers. Masted dial control.
Circle No. 141 on Reader Service Card

Residential Evaporator

Product: Line of residential evaporators for use with hot air systems in duct work of home furnaces.

Manufacturer: Halstead & Mitchell, Pittsburgh, Pa.

Features: Capacities range from 24,000 through 60,000 Btuh. Capacity ratings are extra safe because of exclusive "Turbu-Flo" fin which increases air turbulence to provide added safety factor measure of heat transfer, manufacturer says. Capacities are based on standard conditions of 80-degree d.b. and 67 w.b.



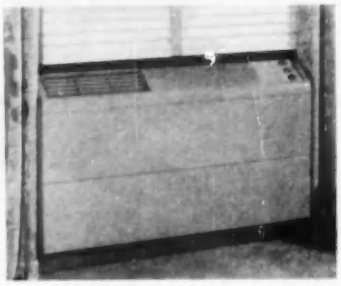
entering air and 40 F suction at 500 fpm. Aluminum fins are mounted on ½" OD copper tubing on 1¼" centers. Insulated with fiberglas throughout. Steel cabinets have twin-coat vinyl protection to prevent rust. Condensate pan also is insulated and corrosion-protected with special mastic.
Circle No. 142 on Reader Service Card

Console Conditioner

Product: Console "Weathermaker" air conditioner.

Manufacturer: Carrier Corp., Syracuse, N. Y.

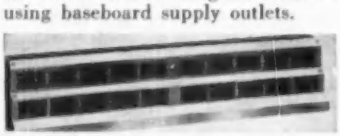
Features: Can be built into wall, or suspended from window sill extending only 6" upward into glass area. Window can be closed when not in use. Also can be installed against casement windows. Designed



for easy inclusion of heating coil replacing radiator and connected to same steam or hot water piping. It then will provide summer cooling and dehumidification, winter heating, and year-round circulation and ventilation with filtered air. Measures only 12 11/16" from front to back and half of this depth can be recessed into wall on built-in installations. Control of air discharge in all directions is provided through adjustable air grilles. Return air is admitted to underside of unit. Outside air damper permits filtered ventilation. Manually controlled two-speed fan. Can be set to exhaust air from room. Available in ¾ and 1-hp sizes, is 41½" long and 23½" high.
Circle No. 143 on Reader Service Card

Baseboard Diffusers

Product: Series 72 extended baseboard diffusers especially suitable for air conditioning installations using baseboard supply outlets.



Manufacturer: Lima Register Co., Lima, Ohio.

Features: 2′ size (shown) has 26.6 sq. in. of free area for residential installations. 4′ size has double capacity for commercial installations.

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Every water-cooled air conditioning and refrigeration system accumulates scale. And as the scale builds up, efficiency comes down. Power bills go up! Sooner or later you have an equipment failure and major repairs. It can all be avoided easily and cheaply. Simply dissolve ANCO CONDENSER CLEANER in the sump while the system is in operation. In a few hours scale and rust are gone and head pressure is back to normal.

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Circle No. 51 on Reader Service Card

Large free area gives models good "throw power" for heavy cooled air, manufacturer says. Can be quickly connected in any multiples required by using Lima joining connectors. Automatic pushbutton damper and permanent finish.

Circle No. 144 on Reader Service Card

Mobile Air Purifier

Product: Mobile air purification unit that can be moved from room to room.

Manufacturer: Barnebey-Cheney Co., Columbus, Ohio.

Features: Complete with wrought-iron stand, designed to give unit more mobility. System eliminates necessity of heating or cooling outside air to be used for ventilation. Helps create comfortable invigorating atmosphere.

Circle No. 145 on Reader Service Card

Steam Trap

Product: Line of small, lightweight, bucket-type steam traps ("Unitrap") for unit heaters and small processing machinery.

Manufacturer: Perfecting Service Co., Charlotte, N. C.

Features: Universal pressure range from 0 to 125 psi for ½" pipe size. Developed for low pressure-

Circle No. 53 on Reader Service Card

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The NEWEST design in water-cooled refrigerant condensers.
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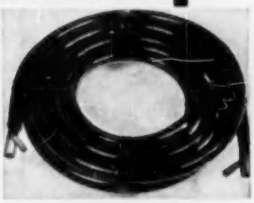

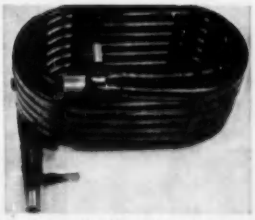

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1½ THROUGH 16 WATTS

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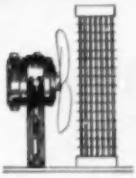
with NEW Redmond TYPE AM-4
SINGLE BEARING MONOMOTOR



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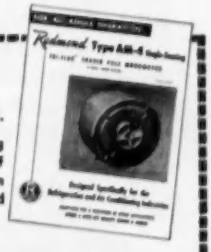

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Capacitors

SAVE valuable time and money... handle those motor-capacitor repair jobs quicker, safer, better, surer and more profitably, with Aerovox AC Capacitors. Sound profits and stay-put jobs go together. That's why the majority of air-conditioning, refrigeration and motor repairmen choose Aerovox. They know that Aerovox pioneered capacitors for motor-run applications and that Aerovox continues to supply the major portion of such capacitors in daily use.

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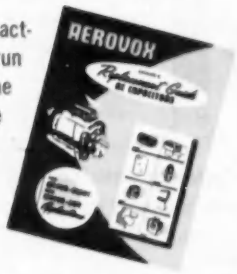

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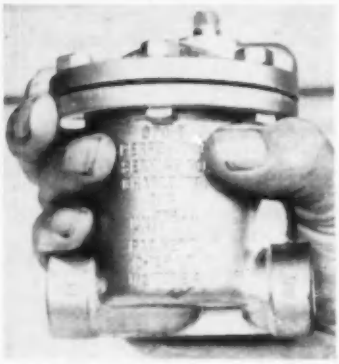
Circle No. 54 on Reader Service Card

high condensate rate applications where smaller and inexpensive trapping unit is needed. Manufacturer claims faster warm-up, less wear, lower maintenance, and capability of

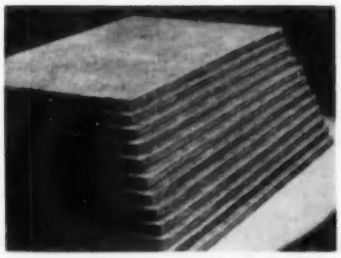


handling more condensate per hour without steam loss. Also available in 1½ and 2″ models. Operates on balanced pressure principle through function of dual valve, which automatically compensates for differential pressures through range of 0 to 250 psi. Positive seating of valve prevents wire draw and loss of steam.

Circle No. 146 on Reader Service Card

Insulation Board

Product: Mineral fiber insulation board for heating, ventilating, and air conditioning duct systems.



Manufacturer: Gustin-Bacon Mfg. Co., Kansas City, Mo.

Features: Semi-rigid insulation with excellent thermal and acoustical properties. Easy to cut with knife to conform to irregular shaped or curved surfaces and not irritating to handle. Available in 24 x 48″ sheets and thicknesses of ¾, 1, 1½, and 2″. For cooling or combination duct work it is available with factory applied vapor barrier.

Circle No. 147 on Reader Service Card

Door Grille

Product: Model ED door grille designed to provide 1″ flanged frame for both sides of door.

Manufacturer: Barber-Colman Co., Rockford, Ill.

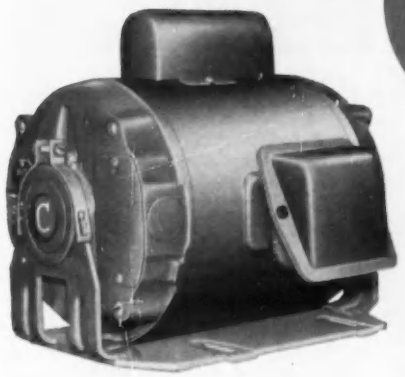
Features: Can be used in door ranging from 1⅜ to 2″ thick. Two

Your choice of normal or low starting current...

with Performance-Rated

Century

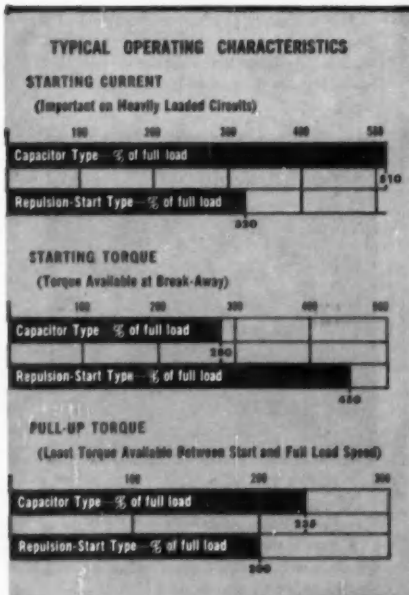
HIGH TORQUE, SINGLE-PHASE MOTORS



Capacitor Motors... ⅛ to 20 H.P. provide high starting torque, high pull-up torque and require normal starting current. They are available in drip proof, dust proof and explosion proof enclosures.

Even if you have severe starting current limitations, you can select the torque you need for sure starts and smooth pull-up to speed from the Century Performance-Rated Single-Phase line (see bar chart below for operating characteristics of two types of Century Single-Phase Motors).

Whatever Your Motor Job . . . there's a Century Motor Performance-Rated to handle it with top effectiveness. Contact your nearby Century branch office or Authorized Distributor.



Repulsion Start, Induction Motors (type RS)... ½ to 7½ H.P. provide very high starting torque, yet require unusually low starting current. They are available in drip proof and splash proof enclosures.

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Circle No. 55 on Reader Service Card

cores are available. One, vision-proof from any angle, has free area of 81.5%. The other has free area of 86.6%. Special baked enamel fin-

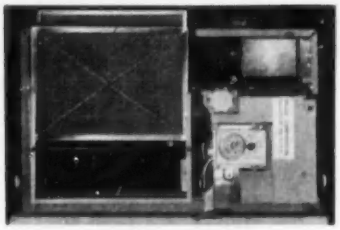
ishes are available to match any color plus several standard types.
Circle No. 148 on Reader Service Card

Hay Fever Conditioner

Product: 1957 line of air conditioners, two of which have "Ionitron" negative ion system (shown on left side of unit) for relief of hay fever.

Manufacturer: Philco Corp., Philadelphia, Pa.

Features: "Ionitron" negatively ionizes air to provide relief for hay fever sufferers. Electrostatic filter system is as much as 500% more efficient than ordinary room conditioner filters, manufacturer says. System in four sections includes two aluminum fine mesh filters, "Ionitron" charger, and activated charcoal filter for absorbing odors. "Super Thrift" series available in one ¾ and two 1-hp models all with automatic temperature control, four-way adjustable grilles, and fresh air. Two 1-hp models make up heat pump series which cools or heats automatically. Both have activated charcoal filters, fresh air ventilation and stale air ex-



haust, and are adjustable flush mounting type. "Super-Thin" series has two ¾ and two 1-hp models, all having ⅓ less depth than previous corresponding units and are designed to fit in window or wall without projecting. Low-cost, 2-hp Residential Model 200-R is designed for 230-volt service. Outdoor louvre and drain kit also are available for this installation. Heavy duty series is 2-hp for 208/230-volt service. Can be installed in window, transom, or built into wall. Equipped with automatic temperature control and has aluminum filter easily cleaned with no replacing necessary.
Circle No. 149 on Reader Service Card

Heating-Cooling Units

Product: "Command-Aire Twins", heating and cooling units which fit side by side and can be installed in a minimum of only 7½ sq.ft.

Manufacturer: Bryant Div., Carrier Corp., Indianapolis, Ind.

Features: Working together, units heat with either gas or oil when it's cold and cool when it's hot. Water-cooled air conditioner available in 2, 3, and 5-ton sizes. Matching heater is forced-air furnace in seven capacities ranging from 50,000 Btuh input to 200,000 Btuh input. Single thermostat operates both units. Conditioner has dual pressure control which shuts off unit when water supply fails or when other ab-

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1. C-D Motor Capacitors start out under the most rigid raw material controls. Passable ingredients are discarded in favor of only the highest purity and quality.
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Circle No. 56 on Reader Service Card

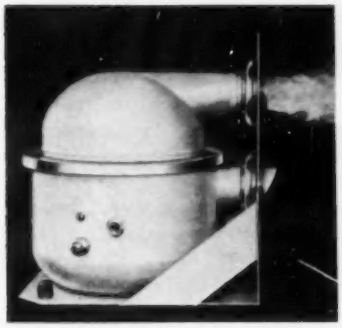
normal conditions affect operation. Compressor remains off until abnormal condition is corrected.

Circle No. 150 on Reader Service Card

Humidifier

Product: Improved Model WF humidifier which offers positive humidification, manufacturer says.

Manufacturer: Walton Laboratories, Inc., Irvington, N. J.



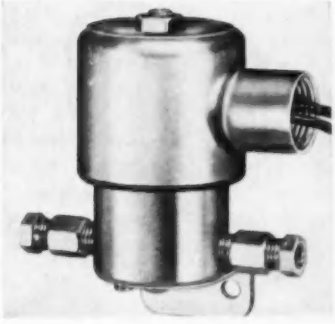
Features: Produces water vapor mechanically by means of patented centrifugal atomizer. Evaporates approximately 10 gallons of water into air stream per day. Simplified installation requires only water and blower connections. No heating coils, wet packs, nozzles, jets, pans, or evaporator plates. Burner capacities up to 140,000 Btuh. Electronic balancing helps eliminate noise and vibration. Consists of copper and nonferrous materials.

Circle No. 151 on Reader Service Card

Electric Air Valve

Product: Electrically-operated air valve.

Manufacturer: Powers Regulator Co., Skokie, Ill.



Features: Closely-held spring, armature, guide, and material tolerances prevent alternating current hum and other noise usually present in similar controls, manufacturer says. Ideal for noiseless control of air conditioning damper motors. Will pass full air at supply pressures up to 25 lbs., when electrically energized. When not energized, valve will waste air from its outlet port and close inlet. Built-in manual adjustment permits valve to pass air when coil is not energized. 60-cycle can be supplied for voltages of 115, 208, 230, or 440. 12″ electrical leads come from rotating housing to facilitate wiring. Port connections are ⅛″ NPT.

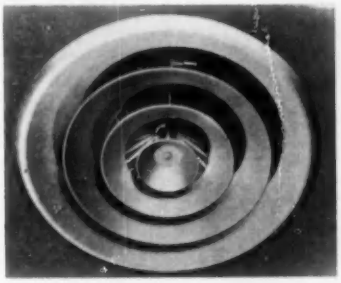
Circle No. 152 on Reader Service Card

Ceiling Air Diffuser

Product: Ceiling air diffuser (Model CM-1-100) with center induction feature and radial distribution.

Manufacturer: Anemostat Corp. of America, New York, N. Y.

Features: Operates on principle of 100% aspiration. Induces, through center of diffuser, approximately 100 cfm of room air for every 100 cfm of primary air brought into it. Discharges air outward along ceil-



ing in layers and draws room air in through center, thus creating uniform air flow throughout room. Supply air is mixed gradually with air in room, assuring draftless distribution. Can handle temperature differentials which are limited only by characteristics of practical refrigeration cycle.

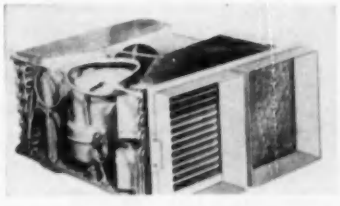
Circle No. 153 on Reader Service Card

Package Conditioner

Product: Residential, multi-room package air conditioners (QR Series) in 2 and 4-hp sizes.

Manufacturer: Mitchell Mfg. Co., Div. of Cory Corp., Chicago, Ill.

Features: Easily installed, re-

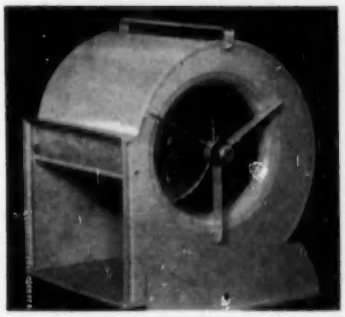


quires only single electrical connection, no refrigeration piping, and no extensive plumbing connections. Complete with ductwork package, "Max-Cool" short run duct system, which eliminates necessity of installer being refrigeration engineer. System virtually eliminates incorrect installation. Can be sold on "do-it-yourself" basis with customer making his own installation. No special knowledge or skill with tools required. Compact units may be placed in attic, basement, or crawl space. Can be attached to existing ductwork.

Circle No. 154 on Reader Service Card

Residential Blowers

Product: Series of assembled blowers and large blower wheels



for residential air conditioning and warm-air heating.

Manufacturer: Torrington Mfg. Co., Torrington, Conn.

Features: Available in six sizes for both belt and direct drive. Center-lock wheel provides quiet operation and maximum air delivery. Heavy-gauge steel and spot-welded housings. Two-motor mounting locations for each angle of discharge. Extra-long sintered bronze bearings with ball bearing assembly encased in rubber. Multi-position unit also available allows user to assemble housing feet in any of four positions.

Circle No. 155 on Reader Service Card

BORG-WARNER FORMS BUILDER SALES DIV.

Borg-Warner Corp., producers of York air conditioning systems, has formed a builder sales division to supply builders with a complete, basement-to-roof package of home equipment and building materials from a single source.

Joseph P. Halpin, formerly national sales manager of Norge Builder Div., has been named general manager.

NEW NAME IS AMP INC.

AMP Inc. has been announced as the new official designation of Aircraft-Marine Products, Harrisburg, Pa.

FLEXIBLE DUCT . . .

Continued from page 73

velocity system in the new stainless steel Socony Mobil Building now being completed in New York City. Here flexibility of the air distribution system was of paramount importance, so that it could be relocated as required from time to time to meet the changing requirements of present and future tenants.

Based on the latest concepts of high velocity air conditioning, this air distribution system was built into the building's modular ceilings by means of "Wiremold" flexible air duct. One sound box is provided in each bay, and four flexible leads are run out of each box to individual diffusers.

YORK DISTRIBUTOR VP

Howard E. Davis Jr. has been appointed vice president and general manager of Air Conditioning Wholesalers, Inc., Boston, Mass.

There's nothing like high reserve capacity!

PA® 400 has the highest capacity for moisture adsorption under the most adverse conditions in refrigerator operation . . . higher than any other desiccant. This reserve capacity is a safety factor. PA 400 keeps the refrigerator running even though there is sufficient moisture in the system to completely "saturate" other desiccants.

No other refrigeration desiccant gives you as much as PA 400 . . .

- Highest capacity
- Minimum pressure drop
- Physical adsorption not chemical action
- Non-dusting
- Adsorbs acids
- Dries refrigerants to below 2ppm at 120° F.
- Non-deliquescent
- Does not channel

Progress Through Chemistry

DAVISON CHEMICAL COMPANY
Division of W. R. Grace & Co.
Baltimore 3, Maryland

Producers of: Catalysts, Inorganic Acids, Triple Superphosphates, Superphosphates, Phosphate Rock, Silica Gels and Silicofluorides. Sole Producers of DAVCO® Granulated Fertilizers.

Circle No. 57 on Reader Service Card

DATA CENTERS . . .

Continued from page 71

and many other facts about the operation of the heating, ventilation, refrigeration, and air conditioning equipment. Switches and indicating gages provide for instantaneous readings of temperatures and simultaneous conditions from several locations. Pilot lights tell when key equipment starts and stops in any area.

From this information, the operating engineer can determine if the equipment is functioning at peak efficiency. He can locate troubles in the system, usually without leaving the central control room.

Normally, the control functions are performed automatically by the system, but the engineer can make changes from his panel as necessary to meet individual comfort needs, solve special temperature problems, or increase the efficiency of the operating equipment.

Pneumatic or electronic temperature control systems can be adapted with equal ease to supervisory panel control.

As advances are made in the detection and control of variables that affect human comfort, as new factors are discovered and as advances are made in the design of "comfort generating" equipment for commercial buildings, the functions performed by a supervisory system can be increased.

Wind direction indicators, wind velocity indicators, sun intensity meters and other detecting devices could be added to existing supervisory systems. Some small installations are already equipped with typewriters which automatically write messages advising the operator of conditions that need correction somewhere in the building.

SALES MANAGER NAMED

Anthony G. Mazzeo has been appointed sales manager of York-New Jersey Distributors, Inc., Jersey City, N. J. Mazzeo formerly was a salesman for Electric Products, Inc., sales agents for York-New Jersey Distributors.

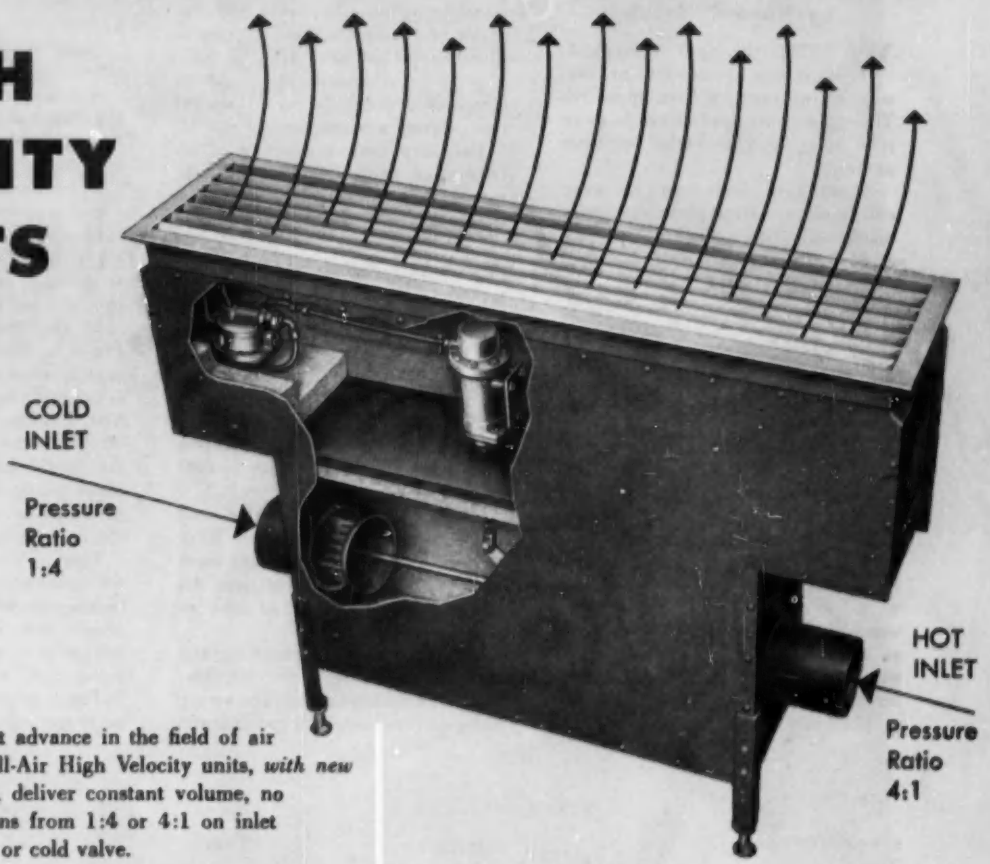
Circle No. 58 on Reader Service Card

ANEMOSTAT *Announces . . . .*

ALL-AIR

CONSTANT VOLUME

HIGH VELOCITY UNITS



Here is a vitally important advance in the field of air distribution. Anemostat All-Air High Velocity units, *with new simple automatic controls*, deliver constant volume, no matter what the fluctuations from 1:4 or 4:1 on inlet pressures of either the hot or cold valve.

Each unit is a single package including the controls and integral thermostats if required. There is complete accessibility of all controls through removable diffusers. No access panels are required. Capacities of CONSTANT VOLUME units can be pre-set at the factory.

These Anemostat CONSTANT VOLUME units

- Assure scientific draft-free distribution of air.
- Are available in 100% induction units.
- Include Anemostat die-cast metal rocket-socket valves. More than 50,000 of these valves are in service, and not a single one has needed maintenance.
- Operate on standard 15 lb positive acting compressed air systems.

See your nearby Anemostat representative for complete details on these revolutionary Anemostat All-Air CONSTANT VOLUME High Velocity units.

Anemostat: The Pioneer of All-Air High Velocity Systems

ANEMOSTAT®

DRAFTLESS *Aspirating* AIR DIFFUSERS

ANEMOSTAT CORPORATION OF AMERICA

10 EAST 39TH STREET, NEW YORK 16, N. Y.

Representatives in Principal Cities

(AC 1546)

Improved Design of Cold Anodizing Tank Reduces Refrigeration Load by 75%

by Hugo C. Smith

WITHIN the past five years, many new applications of commercial refrigeration have appeared. The engineering approaches to these jobs have been as varied as their nature.

About two years ago we were called in to refrigerate a cold anodizing bath. This bath had to be held at 45 F. During the anodizing process, 36 amps of electricity were consumed for each square foot of material coated.

The bath itself consisted of a 15% sulphuric acid solution. During the process the acid was circulated rapidly around the objects to be anodized. The anodizing thus produced was used chiefly on airplane parts, and produced a surface equal to gem hardness.

One other such installation was in use in the country at that time. This job used a 20-ton compressor connected to a lead coil which had been wound around the inside of the tank as shown in Figure 1. Circulation was produced by bubbling air up through the bath.

While this air undoubtedly created a violent agitation in the bath it also in all probability induced a tremendous amount of heat into the solution. In actual operation, the 20-ton compressor probably cycled several times during a batch run.

This is a perfect example of refrigeration being adapted to a job, rather than adapting a job to refrigeration.

Load Difficult to Figure

It is practically impossible to figure a load of this type accurately, as the surface coefficient for the acid solution and the lead pipe is not known. We figured the load on the basis of the electrical energy consumed, as we felt that this would be the largest single factor we would have to deal with.

A tank similar in size to that used in the original installation was insulated with 1" of acid-resistant insulation. A coil compartment was designed on one side of the tank as indicated in Figure 2.

Several means of circulating the bath solution through the coil compartment were considered. The owner finally decided on a 5-hp pump drawing acid from the bottom of the plating compartment and discharging it upward through a distributor pipe across the bank of lead coils.

Two separate lead coils were installed in the bath. These coils were headered on the outside and connected to a 5-hp semi-hermetic unit. It was our educated guess at that time that 5-hp would be sufficient to handle this job on normal production runs. However, by installing a double coil it would be possible to use a second 5-hp condensing unit in a completely separate system as a booster. In actual practice, however, this job has operated perfectly on the one 5-hp unit for over two years without a single service call.

Note that in this installation, as shown in Fig. 2, the design of the coil compartment completely protects the vulnerable lead tubing against damage from the parts being anodized or from careless workers.

The circulation cycle illustrated in Fig. 2 is perfect counterflow, with the coldest solution flowing to the warmest. Primary circulation of this bath is directly over the coils and then over the parts being anodized.

In the installation illustrated in Fig. 1, on the other hand, the most rapidly moving portion of the liquid is not reaching the refrigeration coils first. Inducing air at this point actually heats the bath somewhat so that the liquid has to be chilled to a lower temperature than necessary to produce the proper temperature at the part being anodized.

This is probably one reason for the wide variation in compressor sizes on the two jobs. The other reason is simply this — in the original job the refrigeration was adapted to an existing tank, while in the job shown in Fig. 2 the tank actually was adapted to the refrigeration system.

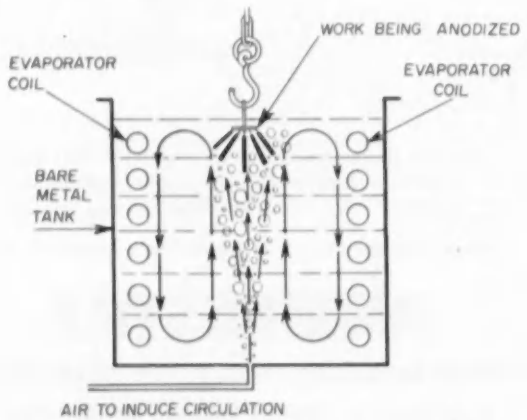


FIG. 1.—Existing anodizing tank (shown in cross section) injected air to induce circulation of solution across bare lead coils.

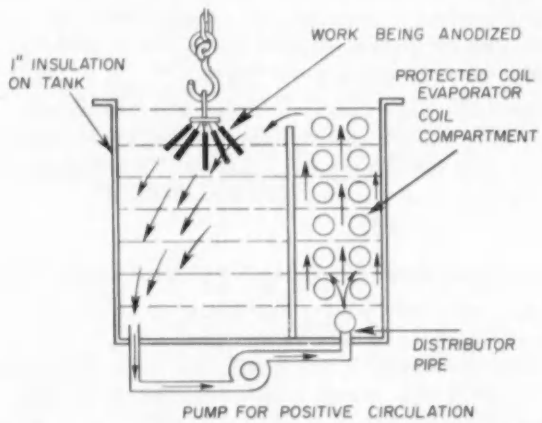


FIG. 2—Improved design employed pump for positive circulation of anodizing bath around coils in protected compartment.

Non-Waxing — Foam-Resistant — unexcelled for all *low*-temperature applications.

Unmatched Stability — under all conditions of refrigerant dilution, heat and pressure.

Specified: by nearly all original equipment manufacturers.

Your Wholesaler Has It!

Distributed nationally by Virginia Smelting Company, 215 Jefferson St., West Norfolk, Virginia.

VIRGINIA® Chemicals

ESOTOO • KINETIC CHEMICAL'S "FREON" REFRIGERANTS • V-METH-L CAN-O-GAS • PERMAGUM • PRESSTITE TAPE • KWIKWRAP • SUNISO REFRIGERATION OILS • WATER TREATMENT CHEMICALS
Available in Canada and many other countries

Circle No. 59 on Reader Service Card

CONTRACTORS

NEWS • ACTIVITIES • PLANS

HUGE MARKET SEEN FOR CENTRAL HOME SYSTEMS

More aggressive selling and educational programs can develop an even larger market for central air conditioning systems in metropolitan areas throughout the nation, according to W. A. Bours III, assistant director of sales of Du Pont's Kinetic Chemicals Div.

Reporting on preliminary findings of a nationwide survey, Du Pont market researchers recently told directors of the Air-Conditioning and Refrigeration Institute that at least 270,000 home owners in metropolitan areas alone seriously and actively are considering purchase of the permanent, centrally-installed type of equipment for mechanically cooling their homes.

Such a figure would more than double the number of homes now equipped with central systems—currently estimated at 250,000 units. A retail market potential of at least a quarter of a billion dollars would be represented.

Bours said that 93% of the interviewees from the survey whose homes now are not centrally air conditioned said they never had been contacted by air conditioning salesmen.

The need for an educational system among air conditioning prospects also is pointed up, Bours said, by survey findings that 64% of nonowners had no idea of either installation or operating costs of a central cooling system. About the same number, however, said their homes either were well suited for air conditioning or could be air conditioned without major change.

USAIRCO DISTRIBUTOR

Coastal Air Conditioning Co., Fords, N. J., has been named a distributor by U. S. Air Conditioning Corp. The firm is headed by Stephen Kiraly, John Kiraly, and James Nolan.

EXPANSION IN RACCA MEMBERSHIP CONTINUES

Continuing growth in membership of Refrigeration and Air Conditioning Contractors Association (National) has been announced by headquarters of the association.

RACCA of Central Indiana, a new local association, has been formed in Indianapolis with seven charter members.

Membership applications have been received recently from Kissell Refrigeration Corp. and National Refrigeration Sales of Los Angeles, Calif., and from Walsh Engineering Co., Sherman, Tex.

New direct members added to the roster in recent months include: Cincinnati Air Conditioning Co. and Twentieth Century Refrigeration Co., Cincinnati, Ohio; Able Service Engineers, Mobile, Ala.; Sweeney Engineering Co., Lima, Ohio; and the following firms from Toledo, Ohio—Davison Associates, Inc.; James A. Foley, Inc.; Hausman Steel Co.; Lumm Corp.; Schmidlin Brothers Heating; John F. Stark & Sons; Refrigeration Maintenance Co.

From Tampa, Fla., come the following new members: Advance Appliance, Inc.; Durant Bros. Air Conditioning & Refrigeration; Krauss Air Conditioning of Tampa, Inc., Southern Mechanical Contractors, Inc.; and Tampa Armature Works, Inc.

TRADE MARK OF QUALITY — that's what the Refrigeration and Air Conditioning Contractors Association (National) is hoping this officially adopted association insignia will become. Acceptance of the emblem is being promoted among RACCA membership on a national basis to identify users as "Qualified" refrigeration and air conditioning contractors under the group's Qualified Contractor Program. As shown above, the insignia is available in the form of electros for imprinting on letter heads, bill heads, and other forms. It also is being incorporated into decals for identifying show windows, trucks, and products of association members. To protect the insignia for RACCA's exclusive use, a trade mark application has been filed with the U.S. Patent Office.

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15 NEW APPRENTICES GRADUATE IN S. CALIF.

Graduation of 15 new apprentice refrigeration fitters has been announced by the Refrigeration and Air Conditioning Contractors Association of Southern California, Inc. upon completion of the course sponsored jointly by this group and the United Association.

John S. Elledge, employed by Hieatt Engineering, received the $100 reward for the "Apprentice of the Year". All 15 graduates were presented with United Association certificates, as well as certificates testifying to their completion of the prescribed program.

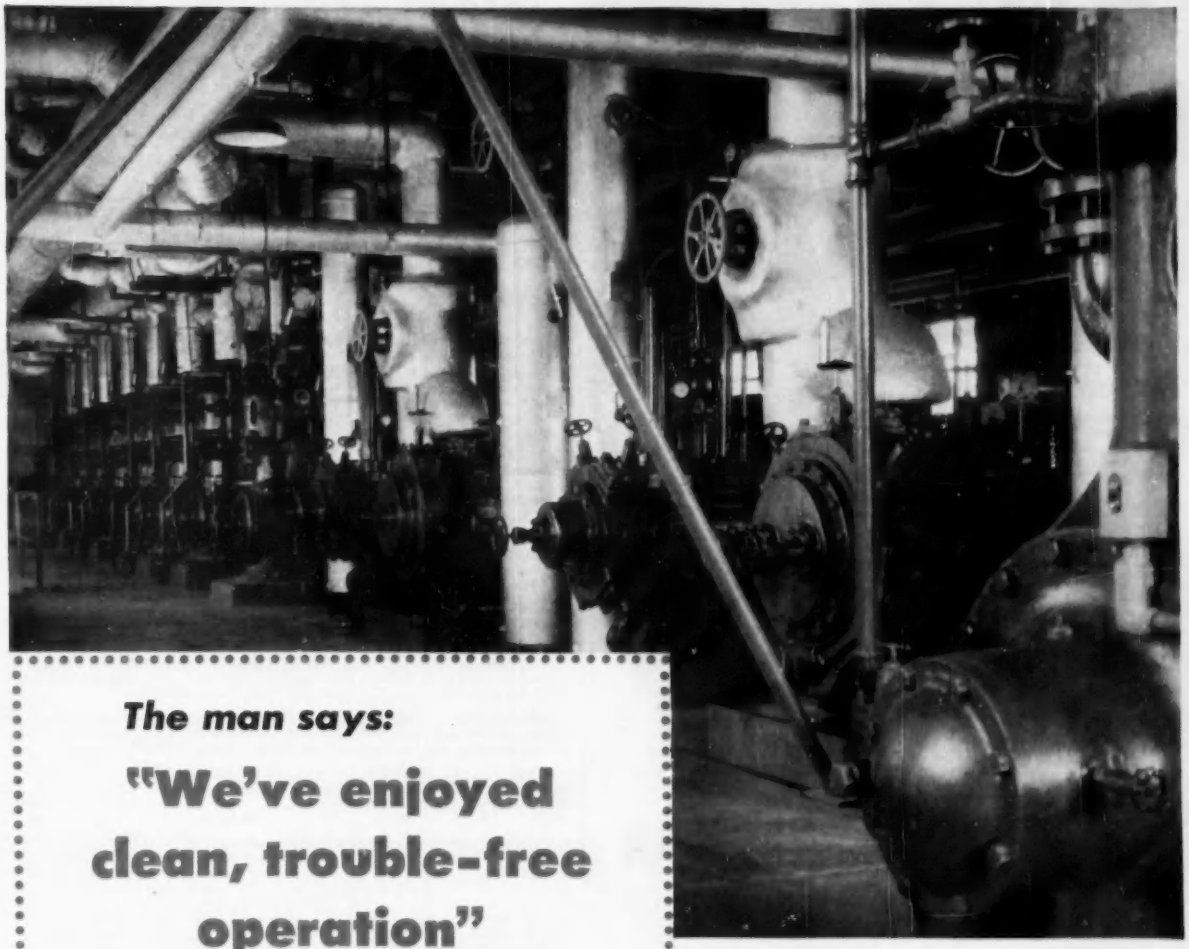
RACCA PLANS MEETING TIMED WITH ARI SHOW

With its 1956 meeting just concluded at Miami Beach, Fla., Refrigeration and Air Conditioning Contractors Association (National) has announced that its 12th annual convention will be held at the Drake Hotel, Chicago, on Nov. 16, 17, and 18, 1957.

This meeting is scheduled in conjunction with the 10th Exposition of the Air-Conditioning and Refrigeration Industry at Chicago's International Ampitheatre on Nov. 18-21, 1957.

LARKIN REP. NAMED

Larkin Coils, Inc., has appointed Wolfe-Evans Co., New Orleans, La., as sales representatives for the states of Louisiana, Mississippi, Arkansas, and parts of Texas, including Houston and the southeastern area.



The man says:

"We've enjoyed clean, trouble-free operation"

THE REFRIGERATION ENGINEER in this, one of the largest plants west of the Mississippi (name on request), has been lubricating his compressors with *Texaco Capella Oil (Waxfree)* for years. He says:

"In a large plant like ours, dependable compressor performance is a must. Ever since we began using *Texaco Capella Oil (Waxfree)* we've enjoyed clean, trouble-free operation, top efficiency and low maintenance costs."

Texaco Capella Oil (Waxfree) offers many advantages: (1) It won't wax out in the system—even at temperatures as low as minus 100° F.; (2) it exceeds Freon floc test requirements and the specifications of all leading refrigeration manufacturers; (3) it is stable and oxidation resistant; (4) it does not foam; and (5) is compatible with all refrigerants.

There is a complete line of *Texaco Capella Oils (Waxfree)* to meet all compressor requirements. Available in 55-gallon and 5-gallon drums, 1-gallon cans, and the more popular grades in 1-quart containers—all refinery sealed to protect purity and quality.

Talk to a Texaco Lubrication Engineer. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Capella Oils (Waxfree)

FOR ALL REFRIGERATING AND AIR CONDITIONING COMPRESSORS

Circle No. 60 on Reader Service Card

Protect Food . . . Protect Profits with LCS*

* LARGEST COIL SURFACE

- **FILTER-FLO COIL**
  - Maintains high humidity
  - Eliminates fast moving air
  - Prevents odor transfer
  - Kills bacteria
- **TITE-SEAL CONSTRUCTION**
  - Long-life
  - Rugged interlock design
  - Faster erection
  - Lower operating costs

Schmidt SANITARY, ALL METAL

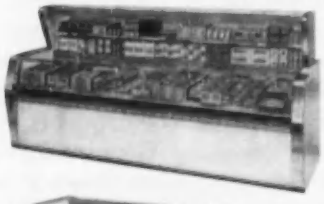
(builders of Thesco Equipment)

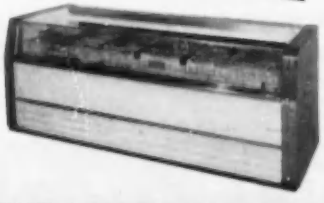
SECTIONAL WALK-IN REFRIGERATORS

3 types: normal, low and two-temperature.

Easily installed outdoors with addition of low cost roof.

Only **SCHMIDT WALK-IN** and **REACH-IN** Models have L. C. S.—largest coil surface in the industry. That means you can install them with complete confidence and know they'll protect your reputation for highest quality refrigeration.





OTHER L C S SCHMIDT CASES FOR FROZEN FOODS:

Endless Construction
Self-Contained Combinations
Island Models
Spot Merchandisers

Write today for full details on "LCS" and the complete Schmidt line!

THE C. SCHMIDT CO.
1712 JOHN ST., CINCINNATI 14, OHIO

THESCO

Circle No. 61 on Reader Service Card

Product Shipments: 1954

Editor's Note: Manufacturers' shipments of major industry products are the best possible barometer of industry climate. For this reason we present on these pages a condensation of the advanced industry reports of the 1954 Census of Manufacturers, as released by the U.S. Department of Commerce, Bureau of the Census.

QUANTITY AND VALUE OF REFRIGERATION MACHINERY SHIPPED BY ALL PRODUCERS IN THE UNITED STATES: 1954 AND 1947

(Includes quantity and value of these products reported **both** by establishments classified in the Refrigeration Machinery Industry, and by those establishments making these items as "secondary" products in the other industries). Data on condensing unit shipments, included in the original Census release, is not presented here, because of later figures available in ARI reports (see page 94). Notes below refer to tables on page 93.

xxx Not applicable.

NA not available.

[1]1947 shipments of frozen food storage, dispensing and display cabinets, coin-operated (code 3585611) included with frozen food storage dispensing and display cabinets, other than coin-operated (code 3585331).

[2]1947 shipments of ice cream dispensing cabinets, coin-operated (code 3585631) are included with ice cream dispensing cabinets, other than coin-operated (code 3585337).

[3]1954 shipments of frozen food storage, dispensing, and display cabinets, coin-operated (code 3585611) are included with other automatic refrigerated merchandising machine, coin-operated (code 3585698).

[4]1947 shipments of absorption and absorption systems and equipment (code 3585726) are included with other components and accessories for air-conditioning and refrigeration equipment (code 3585798).

[5]1954 shipments of air cooled condensers (code 3585789) are included with other components and accessories for air conditioning and refrigeration equipment (code 3585798).

VALUE OF SHIPMENTS FOR AIR CONDITIONING EQUIPMENT AND COMPONENTS AND ACCESSORIES FOR AIR CONDITIONING AND REFRIGERATION EQUIPMENT, BY CLASS OF PRODUCT: 1954-1952

(In thousands of dollars)

Class of product	1954	1953	1952
Condensing units, total	63,699	74,013	*61,439
Ammonia refrigerants	232	214	300
Refrigerants (except ammonia), total	63,467	73,799	61,139
Air-cooled	42,123	55,978	47,359
Water-cooled	21,344	17,841	13,780
Compressors and compressor units, total	127,076	121,054	71,047
Ammonia refrigerants	5,676	5,952	4,708
Refrigerants, except ammonia	121,104	115,102	66,339
Not reported by type	346	.....	.....
Heat-exchanger equipment, total	128,777	82,602	63,666
Evaporative condensers	8,773	8,647	7,179
Air-conditioning units (not self-contained)	22,140	18,918	14,344
Unit coolers, refrigeration	14,733	13,489	11,111
Other heat-exchanger equipment	[3]83,131	41,548	31,032
Self-contained air-conditioning units, total	[2]327,369	293,644	135,579
Window-Sill type	238,404	191,129	70,323
Other than window-sill type	[2]88,965	102,515	65,256
Other air-conditioning and refrigeration equipment, total	91,868	61,567	41,898
Centrifugal refrigeration systems	19,868	14,970	14,040
Ice-making machines	11,960	14,385	12,838
Refrigeration chassis for air-conditioning	[2]26,040	10,298	2,706
Year-round air-conditioning units (self-contained, except heat pumps)	16,652	12,148	4,170
Heat pumps	2,881	1,613	(NA)
Mechanical dehumidifiers, refrigeration type	7,536	6,151	6,431
Absorption and adsorption system and equipment	2,657	2,002	1,713
Packaged liquid chillers	4,274	(NA)	(NA)

NA Not available.

*Revised.

[1]1954 value includes shipments of factory-assembled water-cooling units.

[2]1954 data for residential type self-contained air-conditioners included with refrigeration chassis for air-conditioning.

Product	Total shipments including interplant transfers			
	1954		1947	
	Quantity (number of units)	Value ($1,000)	Quantity (number of units)	Value ($1,000)
Unitary commercial refrigeration equipment	xxx	200,813	xxx	227,349
Mechanical units (including (a) self-contained units, (b) remote units with or without condensing units, and (c) cabinets. Excluding cabinets shipped to other manufacturers of commercial refrigeration equipment):				
Reach-in refrigerators (except dairy refrigerators and wall boxes, and florists cabinets):				
25 cu. ft. and under	6,619	2,403	21,652	5,706
26-40 cu. ft.	7,803	3,340	20,295	6,323
41-60 cu. ft.	5,426	2,939	11,520	4,509
61 cu. ft. and over	3,488	2,704	6,040	3,131
Display cases for meat, dairy products, fish and vegetables (except frozen food):				
Close-top or single-duty	5,728	3,248	15,127	8,394
Closed-double-duty	11,466	8,352	35,676	20,027
Closed-full-vision	1,417	681	6,760	2,813
Open or self-service-single duty	25,249	14,481	9,859	5,262
Open or self-service-double duty	17,937	12,436	9,819	5,282
Low temperature freezing and dispensing equipment:				
Frozen food storage, dispensing and display cabinets, other than coin-operated	29,216	21,598	[4]45,520	[5]19,840
Ice cream counter freezers (including frozen-custard machines)	4,680	5,911	6,676	5,916
Ice cream hardening cabinets	921	453	11,115	3,444
Ice cream dispensing cabinets, other than coin-operated	72,515	23,126	[4]156,065	[4]35,875
Mechanical drinking water coolers:				
Pressure type	115,512	20,130	130,376	23,792
Bottle type	15,816	2,136	34,424	3,983
Mechanical beverage-cooling and dispensing equipment:				
Bottled beverage coolers, other than coin-operated:				
Dry type	61,586	13,386	84,517	15,761
Wet type	4,540	1,110	114,548	15,027
Bulk beverage dispensers (including malt dispensers and precooler cabinets, other than coin-operated)	42,062	6,517	18,804	2,708
Walk-in coolers	10,829	11,251	16,305	11,530
Dairy refrigerators and wall boxes	8,140	4,987	4,359	2,680
Other commercial mechanical refrigeration units (excluding farm and dairy milk coolers, including florists' cabinets, dough retarders, egg refrigeration cases, low temperature laboratory and industrial equipment, mortuary refrigerators etc.)	xxx	25,599	xxx	8,659
Cabinets (for mechanical units) shipped to other manufacturers of commercial refrigeration equipment	xxx	642	xxx	1,264
Farm and dairy milk coolers:				
Immersion type (mechanically refrigerated):				
5 cans and under	4,570	1,247	16,707	2,905
6 cans and over	7,271	3,906	20,856	4,880
Nonmechanical units:				
Nonmechanical bottled beverage and water coolers	23,304	1,163	(NA)	3,021
Other nonmechanical units	16,070	1,530	(NA)	2,081
Other unitary commercial refrigeration equipment including unitary commercial refrigeration equipment, not specified by kind	xxx	5,537	xxx	2,556
Automatic merchandising machines, refrigerated	xxx	44,240	xxx	28,670
Low temperature freezing and dispensing equipment:				
Frozen food storage dispensing and display cabinets, coin-operated	(6)	(6)	(6)	(6)
Ice cream dispensing cabinets, coin-operated	2,559	1,363	(6)	(6)
Mechanical beverage-cooling and dispensing equipment:				
Bottled beverage coolers, coin-operated	140,951	37,018	93,713	24,976
Bulk beverage dispensers, coin-operated	4,065	4,130	4,601	3,694
Other automatic merchandising machines, refrigerated including automatic merchandising machines, refrigerated, not specified by kind, coin-operated	xxx	[6]1,729	...	...
Other refrigeration machinery and air-conditioning equipment	xxx	707,643	xxx	213,802
Packaged air-conditioning equipment:				
Self-contained air-conditioners:				
Window-sill type:				
½ hp	53,731	6,413		
¾ hp	214,676	32,159		
1 hp	688,659	116,791		
Over 1 hp – 1½ hp	346,230	71,014		
Other than window-sill (except units for year-round air-conditioning systems):	41,357	12,027	42,904	9,930
Under 1 hp	3,657	758		
1 hp	5,307	1,720		
1½ hp	4,977	2,153		

Product	Total shipments including interplant transfers			
	1954		1947	
	Quantity (number of units)	Value ($1,000)	Quantity (number of units)	Value ($1,000)
2 tons and over (excluding units intended for residential use):				
2 tons	4,725	3,074	1,179	893
3 tons	17,885	11,988	8,243	5,292
5 tons	28,198	25,995	17,978	15,750
7½ tons	15,591	18,544	1,572	2,096
10 tons	7,063	11,639	897	1,821
15 tons	3,764	8,730	569	1,365
20 tons	685	2,262	184	468
Over 20 tons	419	2,102	251	957
Not reported by size	...	...	1,199	737
Year-round air-conditioners, self-contained:				
Except heat pumps (complete with furnace)	15,932	16,652	(NA)	(NA)
Heat pumps (except room air-conditioners)	1,900	2,881	(NA)	(NA)
Residential-type self-contained air-conditioners	46,821	26,040	(NA)	(NA)
Refrigeration chassis for air-conditioning			(NA)	(NA)
Packaged liquid chillers	2,428	4,274	(NA)	(NA)
Absorption and adsorption systems and equipment	352	2,657	xxx	[10]175
Ice making machines:				
Packaged (self-contained)	23,162	10,306	7,822	3,122
All others (not self-contained)	(NA)	1,655		
Mechanical dehumidifiers, refrigerated-type (self-contained)	104,107	7,536	(NA)	(NA)
Heat exchanger equipment:				
Evaporative condensers:				
5 tons and under	716	220	(NA)	448
5.1 to 7.5 tons	341	187	(NA)	264
7.6 to 10 tons	208	153	(NA)	467
10.1 to 15 tons	510	405	(NA)	528
15.1 to 20 tons	399	408	(NA)	445
20.1 to 30 tons	927	1,154	(NA)	1,334
30.1 to 50 tons	1,143	1,871	(NA)	1,972
50.1 to 100 tons	1,430	4,375	(NA)	2,185
Over 100 tons			(NA)	232
Air-conditioning units not self-contained:				
Suitable for location below the window:				
Motor driven fan type	55,453	5,534	(NA)	(NA)
Induced-air type	32,767	2,864	(NA)	(NA)
All other:				
3 tons and under	4,575	797	(NA)	545
3.1 to 5 tons	2,171	938	(NA)	916
5.1 to 10 tons	2,984	1,772	(NA)	979
10.1 to 25 tons	4,469	4,282	(NA)	2,276
25.1 to 50 tons	2,700	3,913		
Over 50 tons	884	2,040	(NA)	1,492
Unit coolers (refrigeration):				
Ceiling and wall mounted types:				
1,000 BTU/HR and under	3,396	119	(NA)	101
1,001 to 2,000 BTU/HR	27,800	1,099	(NA)	1,065
2,001 to 4,000 BTU/HR	14,985	1,420	(NA)	1,083
4,001 to 6,000 BTU/HR	12,591	1,108	(NA)	909
6,001 to 8,000 BTU/HR	7,195	1,105	(NA)	1,324
8,001 to 12,000 BTU/HR	8,094	1,487	(NA)	1,410
12,001 to 18,000 BTU/HR	6,340	1,544	(NA)	1,695
Over 18,000 BTU/HR	4,659	1,470	(NA)	1,621
Floor mounted (dry type):				
5 tons and under	452	220	(NA)	767
5.1 to 7.5 tons	325	440	(NA)	785
7.6 to 10 tons	234	316	(NA)	531
10.1 to 15 tons	569	613	(NA)	429
Over 15 tons	1,282	2,113	(NA)	172
Floor mounted (spray type):				
5 tons and under	52	58	(NA)	52
5.1 to 7.5 tons			(NA)	812
7.6 to 10 tons	385	994	(NA)	197
10.1 to 15 tons	113	225	(NA)	431
Over 15 tons	158	382	(NA)	575
Shell-and-tube and shell-and-coil condensers	xxx	11,280	xxx	5,903
Shell-and-tube liquid coolers	xxx	4,025	xxx	1,242
Shell-and-coil liquid coolers	xxx	1,632	xxx	426
Fin-coils-steam (except forced air units)	xxx	4,835	xxx	5,358
Fin-coils-water (except forced air units)	xxx	7,840	xxx	10,415
Fin-coils-direct expansion (excluding the bunker gravity-type refrigeration coils)	xxx	16,690	xxx	(NA)
Plate-type evaporators (including bunker gravity type refrigeration coils)	xxx	6,898	xxx	4,902
Surface dehumidifiers	xxx	4,832	xxx	(NA)
Air-cooled condensers	xxx	([11])	(NA)	(NA)
Factory assembled water-cooling towers	(NA)	20,694	(NA)	(NA)
Other heat-exchanger equipment, including tube-in-tube liquid coolers, tube-in-tube condensers, and suction-line heat-exchangers	xxx	4,405	xxx	(NA)
Other components and accessories for air-conditioning and refrigeration equipment	xxx	[12]165,138	xxx	[10]77,023
Other refrigeration machinery and air-conditioning equipment, not specified by kind	xxx	14,359	xxx	37,885

(For more industry statistics, turn to page 94)

July Compressor Shipments Up 66%

Manufacturers' shipments of compressor bodies used in air-conditioning and refrigeration units were up 66% in July over July shipments a year ago, according to figures released by Air-Conditioning and Refrigeration Institute. These figures, which do not include compressors used in household refrigerators, were compiled from reports to ARI from manufactuers whose output is estimated to represent in excess of 90% of the industry.

Actual shipments in July totaled 368,126 units, compared with 221,411 units in July of 1955. Shipments for the first seven months of 1956 totaled 3,175,008 units, against 2,399,302 in the same period of last year, for a gain of 36%. These totals do not include compressors designed for use with ammonia refrigerants.

Of the seven-month total for this year, 194,056 of the compressor bodies shipped were of the type used in automotive air-conditioning—26,569 of them in July. Comparative figures for 1955 are not available, but total 1955 shipments of compressor bodies for automotive use amounted to 255,371 units.

Manufacturers' Shipments of Compressor Bodies
(Except for household refrigerators)

	Shipments Including Exports (number)	
Horsepower*	July, 1956	Jan. - July, 1956
1/5 & under	59,457	353,783
1/4	66,726	530,115
1/3	30,648	212,289
1/2	43,756	309,123
3/4	45,512	573,988
1	32,037	515,326
1-1/2	28,931	229,062
2	8,295	55,344
3	10,120	87,163
5	9,520	67,740
7-1/2	3,905	30,333
10	1,040	6,589
15	388	2,505
20	295	1,864
25	238	1,261
30 & over	689	4,467
TOTAL	**341,557**	**2,980,952**
FOR AMMONIA REFRIGERANT—TOTAL	148	1,221
FOR AUTOMOTIVE AIR CONDITIONING—TOTAL	26,569	194,056
GRAND TOTAL	**368,274**	**3,176,229**

*For all refrigerants **except** ammonia (excluding units for automotive air conditioning).

Reporting Companies: Airtemp, Brunner, Carrier, Copeland, Curtis, Frick, Frigidaire, General Electric, Kelvinator, Lehigh, Servel, Tecumseh, Trane, Vilter, Westinghouse, Worthington, York.

This summary includes all compressor bodies shipped by the reporting companies regardless of whether they were shipped separately or incorporated into a condensing unit or unitary end-use product (such as a room air conditioner, display case, freezer, or commercial refrigerator). Shipments for export are included. Shipments for household refrigerators are not included.

In order to avoid duplication of reporting, shipment figures were requested only from companies that assembled the machined compressor casting with the components necessary to make a complete compressor or motor-compressor assembly.

FRIGIDAIRE DEDICATES NEW TRAINING SCHOOL

Some 275 Frigidaire Div., General Motors Corp., dealers in the Detroit area attended the dedication of Frigidaire's new service training school which opened recently at General Motors' ultra modern Detroit Training Center.

According to E. E. Landis, Frigidaire service manager who acted as host for the occasion, the Detroit Center represents Frigidaire's second participation in GM's nationwide network of 30 such training units, heretofore devoted exclusively to automotive training.

A modern kitchen at the center enables service trainees to solve service problems under actual home conditions.

The school is furnished with latest models of the entire Frigidaire line of air conditioners and refrigeration products.

JAIL BARS QUENCHED IN CHILLED WATER

A 40-ton refrigeration system supplies chilled water for the quenching baths used to chill the steel which Decatur Iron & Steel Co., Decatur, Ala., fabricates into the jail cells which it constructs. A feature of these cells is their novel locking system.

In addition to the 40-ton Worthington compressor, a condenser and a 14 x 10" chiller are incorporated in the refrigeration system. Mechanical contractor for the installation was Hardy Corp., Worthington dealer in Birmingham, Ala.

FRICK OPENS BRANCH

Frick Co. has opened a new branch office at Palo Alto, Calif. The office, at 809 San Antonio Rd., is in charge of Alan J. Vandermade.

Frick's Philadelphia office, headed by Cyril Leech has been moved from the Witherspoon Bldg. to 408 Wilford Bldg.

2 LAB GRANTS TOTAL $18,000 AT PURDUE

Purdue University has received two grants totalling $18,000, from Revco, Inc., and Addison Products, to support its newly formed national center for research on refrigeration and climate control and their effects on humans and animals. Both gifts, to be used over the initial three-year period of the center's life, are for $3,000 annually.

Made possible by an initial grant of $300,000 from Tecumseh Products Co., the center has begun a major fund campaign reaching for a total of over $1,000,000 with which to complete the necessary buildings and instrumentation and to carry out the initial three-year program. L. W. Larsen heads a volunteer committee from the industry to raise the funds.

Purdue itself has nearly matched the Tecumseh grant, making available $252,500. With the new grants making a total of $570,500, an additional $582,000 is being sought.

EXPORT AGENT NAMED

Dualex International, export firm, has been licensed to represent Buensod-Stacey, Inc., in South and Central America.

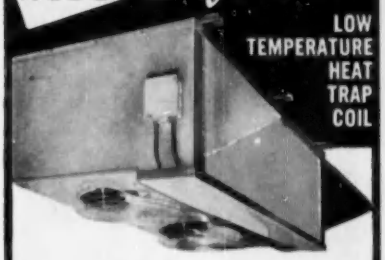
Calendar of Industry Conventions

Dec. 3-4	National Commercial Refrigerator Sales Assn. (Annual Meeting)	San Francisco, Calif. Mark Hopkins Hotel
Feb. 25-March 1, 1957	American Society of Heating and Air-Conditioning Engineers, Inc. (Annual Meeting)	Chicago, Ill. Conrad Hilton Hotel
Feb. 25-March 1, 1957	International Heating and Air Conditioning Exposition	Chicago, Ill. Intl. Amphitheatre
April 5-7, 1957	Refrigeration Service Engineers Society (Educational Forum)	San Francisco, Calif. Sheraton-Palace Hotel
May 6-8, 1957	Air-Conditioning and Refrigeration Institute (Annual Meeting)	Hot Springs, Va. The Hometsead
May 6-10, 1957	National Restaurant Assn. (Convention and Exposition)	Chicago, Ill. Navy Pier
May 7-10, 1957	Heating, Piping and Air Conditioning Contractors National Assn. (The Mechanical Contractors Association of America) (Annual Meeting)	Miami Beach, Fla. Hotel Fontainebleau
June 2-5, 1957	The American Society of Refrigerating Engineers (Annual Meeting)	Miami Beach, Fla. Hotel Fontainebleau
June 24-27, 1957	American Society of Heating and Air-Conditioning Engineers, Inc. (Semi-Annual Meeting)	Quebec, Canada Murray Bay
Nov. 18-21, 1957	10th Exposition of Air Conditioning & Ref'n. Industry	Chicago, Ill. Intl. Amphitheatre

Circle No. 64 on Reader Service Card

WITT *Defrostair*

LOW TEMPERATURE HEAT TRAP COIL



DEFROSTS AUTOMATICALLY

FOR FRESH MEAT ROOMS BELOW 34°F, FOOD STORAGE, FOOD FREEZING, ICE CREAM STORAGE, INDUSTRIAL LOW TEMPERATURE APPLICATIONS.

Defrostair's patented heat trap system takes advantage of the fact that warm air rises and can be trapped under a hood. For example, move your hand a few inches above a lighted candle and only a small amount of heat is felt. Now place a metal container over the candle. In a matter of minutes it is extremely hot because the heat is confined under the canopy or hood.

Witt Defrostair patented heat trap coil requires only a low cost single pole, double throw time clock for complete automatic defrosting. Easy low cost installation, requires no re-evaporation or special plumbing. Available in 14 models ranging in BTU capacities of from 3800 to 38,000 at 10°T.D.

Write for data sheet

ONE OF A FINE LINE OF WITT *Coils*

A. H. WITT COMPANY
940 N. SYCAMORE AVE.
LOS ANGELES 38, CALIF.

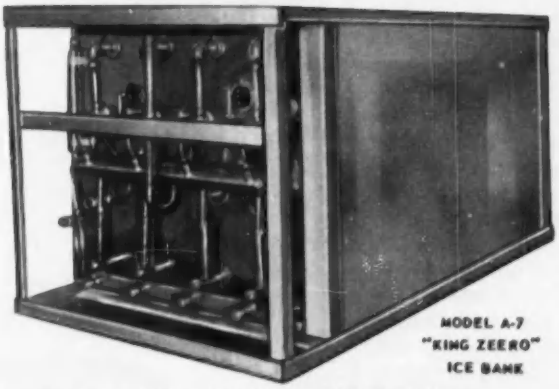
"King Zeero's" Sweet Water ICE BANKS offer ICE-CONCENTRATED Refrigeration for Air Conditioning

CONTINUOUS RIFLED GALVANIZED COILS
EXPANSION VALVE CONTROLLED

32°-34° COLD ICE WATER

DESIGNED FOR USE WITH:
FREON — METHYL CHLORIDE — AMMONIA

The "King Zeero" ICE BANK is designed for air cooling in Churches, Mortuaries, Theatres, Offices, Stores, Auditoriums, Factories, Clubs, Restaurants, etc. Ice Banks may be added to existing systems for increased capacity.



MODEL A-7
"KING ZEERO"
ICE BANK

The "King Zeero" ICE BANK is designed to deliver tons of 32 to 34 F. ice water for recirculation through air cooling coils. Peak loads many times compressor capacity are easily handled.

- DIRECTED COURSE OF WATER travels with "built-in" agitation.
- NO MECHANICAL AGITATION REQUIRED.
- LARGE WATER COMPARTMENTS spaced on 11" and 12" centers.
- 33% EXTRA ICE CAPACITY safely attained without freezing up.
- ICE IS "BURNED OFF" PLATE COILS progressively, exposing prime and secondary surface for maximum flash cooling capacity.
- ICE THICKNESS automatically controlled - eliminates "freeze ups."
- 94 SIZES to fit space requirements. Other designs for special applications. MAIL COUPON TODAY

CAPACITIES - 500 lbs. to 30,000 lbs. (72,000 B.T.U.'s to 4,320,000 B.T.U.'s) in a single unit. Multiple units may be installed.

THE KING ZEERO COMPANY
4300-14 W. Montrose Ave., Chicago 41, Ill.

King Zeero Co., 4302 W. Montrose Ave., Chicago 41, Ill

☐ Please send me your new ICE BANK Catalog.

Name _____

Address _____

City _____ State _____

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if you need valves

or driers sight glasses heat exchangers

or fittings of any kind

ask your jobber for the best ...ask for

VSF

Superior
valve & fittings co.
pittsburgh 26, pa.

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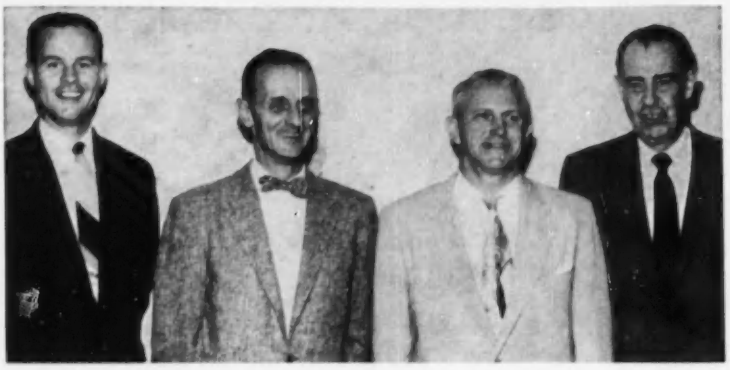
Named To Head Wholesalers in '57



ELECTED OFFICERS of Air Conditioning & Refrigeration Wholesalers for the coming year are (left to right): C. G. Koopman, secretary; W. J. Hieber, vice president; I. J. Fajans, president; and W. C. Miessemer, treasurer.

ARW SPONSORS CLINICS ON PRODUCT KNOWLEDGE

Irving J. Fajans, Aetna Supply Co., New York City, was elected president of Air Conditioning and Refrigeration Wholesalers at the twenty-first annual meeting of the organization in the Jung Hotel, New Orleans, Oct. 24-26.

William J. Hieber, of Refrigerative Supply, Portland, Ore., was named vice president; Charles G. Koopman, of Supply Distributors Corp., Boston, secretary; and W. C. Miessemer, of Arizona Refrigeration Supplies, Phoenix, treasurer.

New ARW directors are Merle Titus, of Dennis Supply Co., Omaha; and Boyd W. Evans, of United Refrigeration Supply Co., Memphis. Re-elected directors were Fajans and Hieber.

It was announced at the meeting that the first of an anticipated series of "product knowledge clinics" will be held in Chicago on Dec. 14 and 15. Aim of the clinic is to offer help to air conditioning contractors in the area in solving their application problems, and to impress on them the wide variety of equipment and services available to them through ARW member wholesaler firms.

Site of the Chicago "clinic" will be the Morrison Hotel, and sponsors are ARW members in Region 6, comprising Illinois, Wisconsin and part of Indiana. The initial clinic will serve as a pattern for later programs expected to be put on in other sections of the country.

The program in Chicago will consist of a series of "clinic" sessions in the form of panel discussions covering subjects of particular interest to dealers and contractors. Experts from manufacturers and other industry elements will serve on the panel and will lead these discussions.

NEW PORTABLE STEAM CLEANER

ELECTRICALLY HEATED
WEIGHS ONLY 50 LBS.

Now...
STEAM CLEAN AT THE JOB

- *Cleans, de-greases, removes contamination without disassembly*
- *Safe and simple to operate—cuts man hours up to 85%*
- *Low Cost, heats standard circuit*

HALKIRK

HALKIRK CO.
BOX 612A
MANHATTAN BEACH CALIFORNIA

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Also, manufacturers wishing to participate will have "conference booths" where they will answer specific questions having to do with their own product. These will be manned by local area representatives for the most part, but factory experts and engineers will staff the discussion panel boards.

Panel discussions will cover six or seven subjects, including commercial, residential and industrial phases of air conditioning, and refrigeration equipment generally.

In this, the "product knowledge clinics" will be similar to the ARI-RSES "educational conferences". However, in the ARW clinics there will be no educational exhibits in the manufacturers' booths.

The two-day program will wind up with a special entertainment program in the Terrace Room of the Morrison Hotel.

It is planned to invite all local industry persons to the clinic sessions. Special attention, however, will be paid to dealers and contractors in the heating field, many of whom have been coming to ARW wholesalers for product information, especially in the cooling phase of air conditioning. Idea is to make the ARW wholesaler the logical firm to look to both for supplies needed in air conditioning and refrigeration work and as an "information center" on the products used in this field.

ARW committee in charge of the Chicago affair has as members J. P. Glass, Jr., James Alter, and E. Peter Sorensen. Representing the manufacturers is Herman Goldberg of Standard Refrigeration Co., who also is in charge of the entertainment program.

GOV'T RULES SLOW SALE OF CONDITIONED HOMES

Difficulties in qualifying prospective purchasers of air conditioned homes for FHA-insured and VA-guaranteed mortgages were pointed out by home builders at a recent meeting at the National Housing Center.

Richard G. Hughes, meeting chairman, said that a deterrent in selling such homes was the formula used by FHA in qualifying buyers, whereby the buyer of a small home is required to have $200-250 per month more to buy a home with air conditioning.

The center has issued a 10-page "Summary Report of Conference on Air Conditioned Homes" giving factual data on the cost, maintenance, and financing problems involved in the construction and selling of centrally air conditioned homes.

The meeting was attended by more than 100 home builders, government officials, and air conditioning industry representatives.

ITALY SHIPMENT SET

Buensod-Stacey, Inc., soon will begin shipments of its dual-duct air conditioning equipment to Milan, Italy, for a large air conditioning project there, the Edificio Pierlli. Installation was arranged by the company's licensee in Milan, Officine Di Sevesco.

AIRTEMP DISTRIBUTOR

Pugh Heating & Air Conditioning Co., Toledo, Ohio, has been named area distributor for Airtemp Div., Chrysler Corp.

Clean Fittings FASTER . . . for Better Sweat Connections!

Schaefer COPPER TUBE FITTING BRUSHES

Here's the quick, easy, "painless" way to clean copper tube fittings for more secure leakproof installations! Just a quick twist of the Schaefer Brush and the fitting is clean — in a fraction of usual time, and without sore fingers. Complete range of sizes for O.D. and nominal fittings, with rustproof stainless steel wire bristles and comfortable hand grips. Write for prices.

Schaefer BRUSH MFG. COMPANY

117 W. WALKER ST., MILWAUKEE 4, WIS.

Write for details on special brush needs.

BUY SCHAEFER . . . IT'S SAFER

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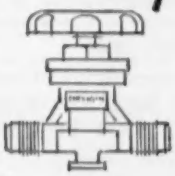
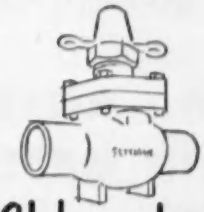
calling your jobber today?



if it's Line or



Globe valves

take it easy on yourself... ask for these "Trouble free" valves by

Superior

valve & fittings co.

pittsburgh 26, pa.

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AIRTEMP TRAINEES GET FINAL BRIEFING

COURSE COMPLETED, these four field training supervisors of Airtemp Div., Chrysler Corp., receive one last word of instruction from J. A. Clarke, sales training manager. Left to right are Clarke, W. H. Tanner, Dallas conference area; C. W. Hildenbrand, New York conference area; W. H. Denton, Atlanta area; and J. D. Otellio, Chicago. The four supervisors spent four weeks in their respective territories developing local conference (school) programs.

250 GE DEALERS EARN WEEK'S TRIP TO PARIS

Over 250 General Electric Co. dealers and their wives throughout the country recently earned a week's holiday trip to Paris as a result of increased sales of GE packaged air conditioning units during 1956.

The awarded dealers left for the continent in two groups. After visiting New York City for a day, they departed by plane for Paris. Representatives of GE Commercial & Industrial Air Conditioning Dept. with headquarters at Bloomfield, N. J. accompanied the dealers. Altogether, four Pan American planes were chartered for the occasion.

Dealers were accompanied in many cases by their wives for whom they had earned sufficient credit to entitle them to make the trip.

WOLVERINE EXPANDS MILL DEPOT FACILITIES

Wolverine Tube, Div. of Calumet & Hecla, Inc., has opened a new mill depot in Dayton, Ohio. Copper water tube, refrigeration tube, and automotive tube will be stocked there.

This new service facility has been instituted to speed shipping service to the State of Ohio and surrounding areas. James Jolly will coordinate the new operation from the Dayton office.

New **ANEMOTHERM AIR METER** *gives you*

Air Velocity
Air Temperature
Static Pressure
with

PUSHBUTTON
ease

The new model 60 Anemotherm Air Meter helps you balance heating, ventilating and air conditioning systems the modern pushbutton way. It puts air velocity, air temperature and static pressure at your fingertips ... pays for itself through time saved on only one major job. • **Write for Bulletin 55 giving all essential data.**

AC 13388

ANEMOSTAT CORPORATION OF AMERICA
10 EAST 39th STREET, NEW YORK 16, N. Y.

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TRADE FRICK MARK

High-pressure Valves & Fittings

Large handwheel
Long oversized stem
Ample packing
One-piece collar box and bonnet
Back seat permits repacking in use
High-angle seat insures tightness
Standard flanges: screwed sizes to 2"
Full opening; developed for heavy duty

Are preferred for high-pressure services, 300 to 1500 lb., 300 degrees. Sizes ¼" thru 14". Stocked by Frick Distributors, the world over. Get new catalog with prices, weight, dimensions, working pressures, parts and useful tables.

Frick line includes fittings, safety valves, gauge glasses, return bends, manifolds and welded work.

WAYNESBORO, PENNA., U.S.A.
FRICK CO.

Circle No. 63 on Reader Service Card

OPPORTUNITIES

(Classified Advertising)

Rates: for "Positions Wanted," $6.50 minimum, limit 25 words. For all other classifications, $8.00 minimum for 25 words or under, each additional word 20¢. Boldface type or all capitals, $10.00 minimum for 25 words or under, each additional word 25¢. All classified advertising payable in advance.

POSITIONS AVAILABLE

SALES ENGINEERS — Excellent opportunities with well-established and progressive chemical manufacturer in selling high quality line of refrigeration supplies and chemicals to manufacturers and wholesalers of refrigeration parts and supplies. Age 30-38 with at least 5 years sales experience. Must travel in 2 to 3 state area. Compensation commensurate with background and ability. Replies confidential. Write Box 12556, COMMERCIAL REFRIGERATION & AIR CONDITIONING.

DISTRICT SUPERVISORS for three territories in which we will expand our operations. Probable headquarters Dallas or Fort Worth, Texas; Washington, D. C.; Baltimore or Richmond, Va.; Kansas City, St. Louis, Wichita or Oklahoma City or comparable locations. We are now successfully operating in major areas of the United States and are ready to apply the same aggressive program in these areas where we already have both satisfied distributors and owners. Your efforts will be supported by national trade paper advertising and trade shows. Our products are commercial display and storage refrigerators. They can be merchandised successfully along with an allied but noncompetitive line through refrigeration dealers. You can't write your own ticket but our remuneration plan enables you to set your own earnings ceiling. Write brief history of experience to Box 12356, COMMERCIAL REFRIGERATION & AIR CONDITIONING.

SALESMAN: Energetic young man with car to sell Refrig. and Air Cond. Equip. and parts to established accts for an aggressive wholesaler in Chicago. Profit sharing and pension plan and $100.00 weekly draw against commission. Prefer someone with experience in this field. Harry G. Johnson, Sales Mgr., Fred C. Kramer Co., 128 S. Paulina St., Chicago, Ill.

For past twenty-five years, we have devoted our entire efforts to installation of air conditioning equipment from residential to three hundred tons capacity. Right now, we need one more experienced man for installation and service. Knowledge of Carrier equipment advantageous. Permanent, steady top pay. Ohio. Box 12456, COMMERCIAL REFRIGERATION & AIR CONDITIONING.

REPRESENTATIVES WANTED

Manufacturer's Representative by a small, stable company providing horizontal, vertical and remote air-cooled residential air conditioners. Units are attractively priced and small remote unit is ideal for new home construction. Liberal commission paid to able salesman. Write Box 12156, COMMERCIAL REFRIGERATION & AIR CONDITIONING.

BUSINESS OPPORTUNITIES

WANTED — products or new product ideas that can be sold restaurant and institutional markets by reputable manufacturer with national dealer selling organization. Royalty or outright purchase. Confidential. Write: Box 12256, COMMERCIAL REFRIGERATION & AIR CONDITIONING.

DISTRIBUTOR NAMED

United States Gauge Div. of American Machine and Metals, Inc., announces the appointment of M. S. Jacobs & Associates, Inc., Pittsburgh, Pa., as a U. S. Gauge master distributor.

GEN'L CONTROLS EXPANDS

General Controls Co. announces new and larger facilities in its St. Louis branch territory. Joseph S. Fillo is in charge.

ROTARY SEAL

Replacement Units

Available in a wide size range for Commercial, Semi-Commercial, Air Conditioning and Home Refrigerators.

EASY TO INSTALL ★ ECONOMICAL

2020 NORTH LARRABEE STREET
CHICAGO 14, ILLINOIS, U.S.A.

Circle No. 73 on Reader Service Card

(Advertisement)

No. 2 in a series on refrigeration.

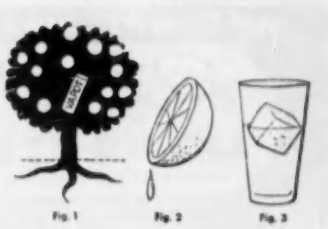

DIAGRAM A

THE ORANGE is round, like the earth, but juicier.

There are two basic varieties, the Navel and the Valencia. The Navel orange has a navel on it. Presumably the Valencia has a valencia on it, somewhere.

Oranges grow on trees. (See Fig. 1, Dia. A, above.) The tree operates in an efficient manner and is a splendid example of hydraulic engineering. The principle of its operation is simple. The tree draws moisture from the earth, processes it and pumps it into globes where it is reduced to orange juice. Note Fig. 2, above, which represents a halved orange losing a drop of juice.

That's all there is to an orange tree. Mankind takes it from there and may even add 2 oz. of vodka to a glass of juice—Fig. 3.

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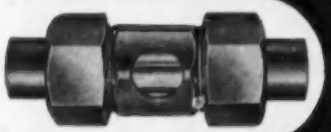

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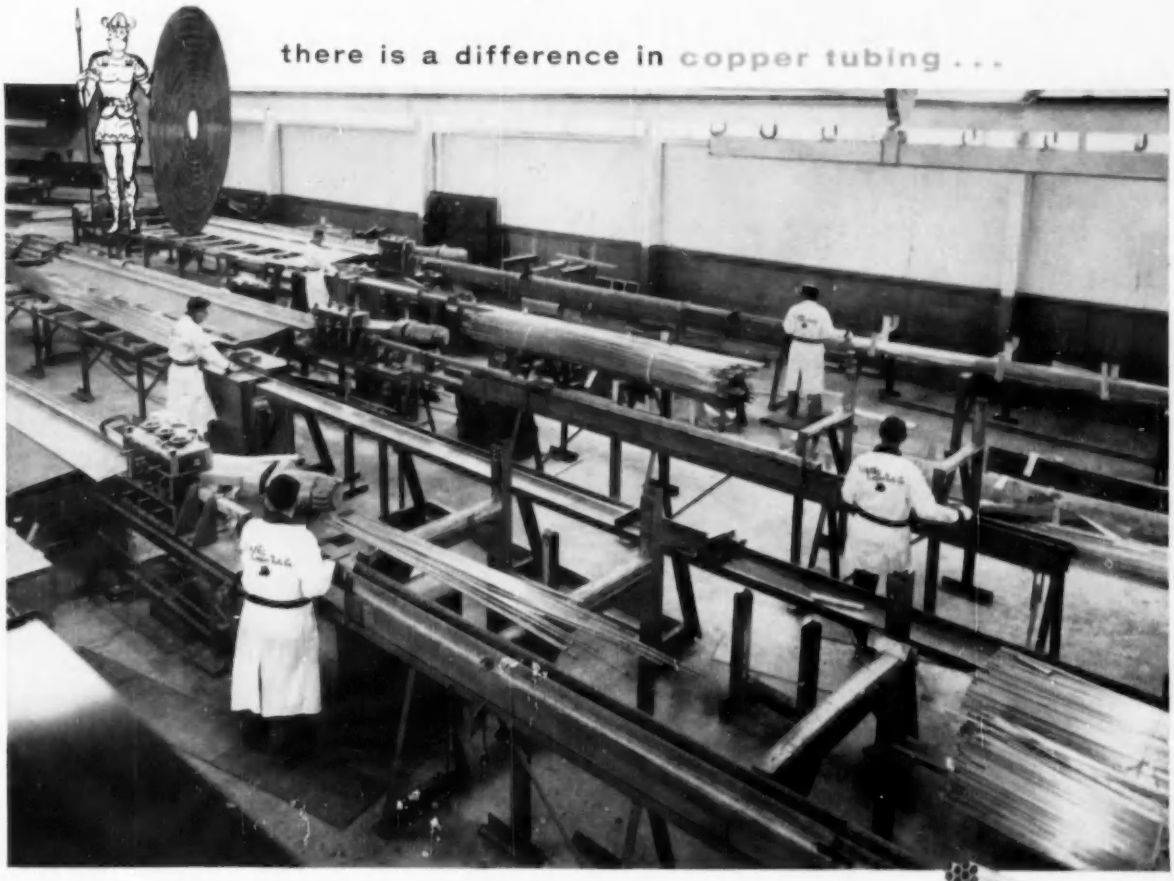
there is a difference in copper tubing . . .



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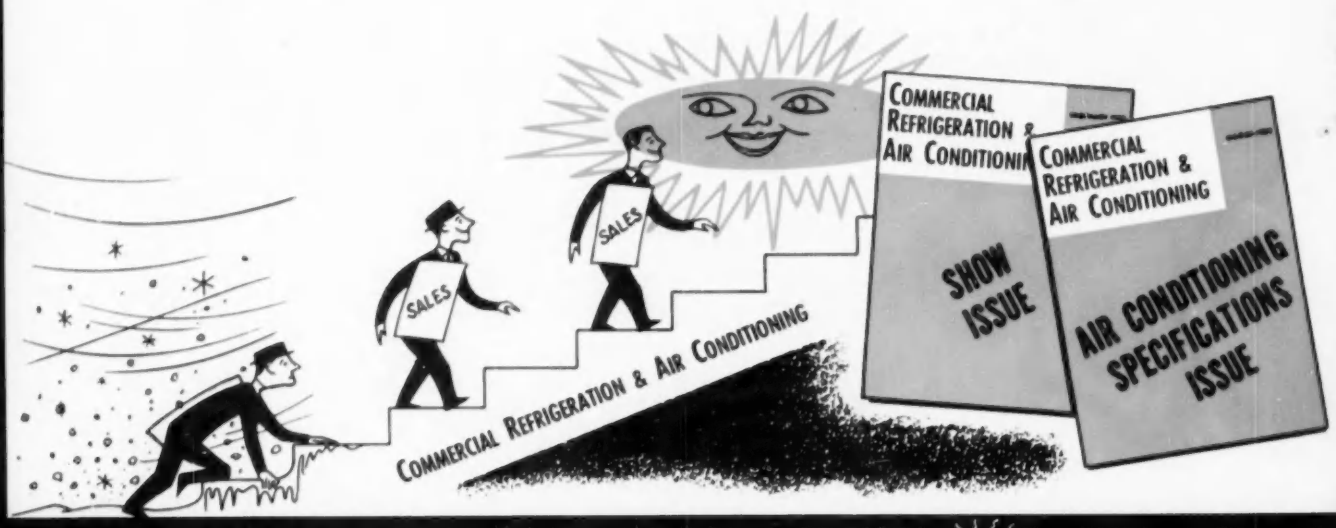

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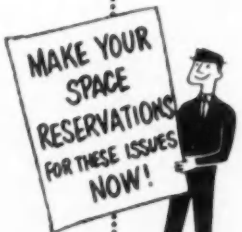

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